

Syntec VitMan[®]

OWNER'S MANUAL



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1000663P

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Chapter 1: GENERAL INFORMATION

INTRODUCTION

The **Syntec VitMan®** is a full-featured vitrectomy system that can optionally support anterior ophthalmic surgical procedures.

The **Syntec VitMan®** provides a highly responsive aspiration system with up to a full 500 mmHg vacuum.

The built-in light source provides full light output to each of three optical fibers. True white light dimming is provided by a shutter mechanism located within the optical lens arrangement.

The system supports the air exchange function and provides high vitrectomy cut rates of up to 2000 cuts per minute. The vitrectors available from **Syntec** have a guaranteed cut rate performance, as detailed in ACCESSORIES DESCRIPTION for VITRECTOMY CUTTER on page 85.

The system has a built in floppy disk drive to record key parameters that provide the surgeon with an electronic record to supplement other documentation devices. The disk drive also provides a mechanism for system software upgrades, surgeon specific system initialization, and diagnostics.

Ultrasound lens fragmentation is an optional accessory. All references to ultrasound in this manual assume that your **Syntec VitMan®** is configured with the ultrasound option. If your system is not equipped with the ultrasound option, ignore any references to ultrasound. All other functions and modes operate as described. An ultrasound upgrade is available from Syntec, Inc. which includes all components and software necessary to add ultrasound.

GENERAL INFORMATION

INDICATIONS FOR USE

The **Syntec VitMan®** is indicated for use in support of the following ophthalmic surgical procedures:

Removal of vitreous because of:

- Vitreous cloudiness

- Diabetic vitreal hemorrhaging

- Trauma

 - Contusions

 - Penetrations

 - Intraocular foreign bodies

- Opacity

- Inflammation

 - Endophthalmitis

 - Bacterial

 - Fungal

 - Uveitis

 - Removal of lens remnants after cataract surgery

- Remove vitreous traction under the retina producing localized or complete retinal detachment

- Removal of samples of vitreous for diagnostic purposes i.e. endophthalmitis.

- Treatment of vitreous loss during cataract surgery

- Clean vitreous strands from the cataract wound

- Perform emulsification of cataractous lens and its removal by aspiration and irrigation

- Provide internal illumination for vitreous surgery

- Provide air pressure for maintaining intraocular pressure for retinal surgery

GENERAL INFORMATION

EQUIPMENT SPECIFICATIONS

PHYSICAL DIMENSIONS & WEIGHT: CONSOLE:

Size:	Height:	6 inches, 15 cm
	Width:	21 inches, 55 cm
	Depth:	19 inches, 48 cm
Weight:	Approx:	45 Pounds, 20 Kilograms

FOOT PEDAL:

Size:	Height:	6 inches, 15 cm
	Width:	9 inches, 23 cm
	Depth:	10 inches, 25 cm
Weight:	Approx:	8 Pounds, 3.6 Kilograms

Shipping Weight: Both the Console & Foot Pedal ship together for a total weight of: 84 Pounds, 38 Kilograms

ENVIRONMENTAL:

Operating Ambient Temperature Range:	50 to 85 °F 10 to 30 °C
Maximum Relative Humidity:	90 % (Non-Condensing)

ELECTRICAL POWER:

Input Power:	950 VA maximum (750 VA typical)
Line Voltage:	90 to 250 VAC, Single Phase
Line Frequency:	50 to 60 Hertz
Fuse: Current Rating:	10 A @ 125 V range 6.3 A @ 250 V range
Style:	5x20mm

ASPIRATION:

Operating Range:	0 to 500 mmHg at sea level
Control Increment:	5 mmHg
Adjustable Rise Time:	250 milliseconds to 10 seconds
Cassette Capacity:	300 ml
Cassette Connector:	Female Luer Lock

GENERAL INFORMATION

VITRECTOMY:

Pneumatic Control: Single Cut, 5 to 1500 Cuts Per Minute (CPM)
Control Increment: 5 CPM
Vitrector Connector: Male Luer Lock

Performance With Vitrectomy Cutter Available From **Syntec**:

Maximum Cut Rate: Tested to 2000 CPM (Reorder #1024)
Vitrectomy Cutter: 30 psi Guillotine Type

AIR EXCHANGE:

Positive Pressure Operating Range: 1 to 100 mmHg
Control Increment: 1 mmHg
Air Exchange Connector: Female Luer Lock

ILLUMINATION:

Type Source: **TRIPLE OUTPUT**, Incandescent, 150 Watt,
24 Volt, Tungsten-Halogen Bulb (Reorder #1090)
Intensity Control: True White Light Dimming
Backup Bulb: Automatically Switched
Fiber Optic Length: 2 meters

ULTRASOUND LENS FRAGMENTATION:

Operating Frequency: 40 kHz
Operating Power Range: 1% to 100%
Control Increment: 1%
Pulse Mode Range: 1 to 20 Pulses Per Second (PPS)
Control Increment: 1 PPS
Maximum Power: 40 Watts $\pm 10\%$
Handpiece Construction: All Exterior Metal: Titanium
Weight: Approx. 3 oz., 85 grams
Excluding cord & connector

DISPLAY:

Type: Liquid Crystal, Backlit
Height: 2.75 inches, 69.8 mm
Width: 2.75 inches, 69.8 mm

GENERAL INFORMATION

WARRANTY & SERVICE

WARRANTY:

The Syntec VitMan[®] carries a full parts and labor warranty on components as follows:

Console:	One Year
Foot Pedal:	One Year
Posterior Ultrasound Handpiece:	One Year
Anterior Ultrasound Handpiece:	Six Months



NOTE: Replacement guarantees during the term of the warranty are subject to the determination by the manufacturer that component failure occurred under conditions of normal use. It is the responsibility of the customer to follow the routine care and maintenance instructions provided in this manual.

SERVICE:

The Syntec VitMan[®] is a sophisticated, electronically controlled, multifunction medical device. It has passed rigorous safety (I.E.C. 601-1, U.L. 2601) and effectiveness testing. All service beyond normal, routine maintenance as defined in this manual, shall be performed by qualified technicians, certified by the manufacturer.



NOTE: Service performed by other than certified technicians will void the manufacturer's warranty.

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Chapter 2: EQUIPMENT SET UP & OPERATION

BACK PANEL CONNECTORS & CONTROLS

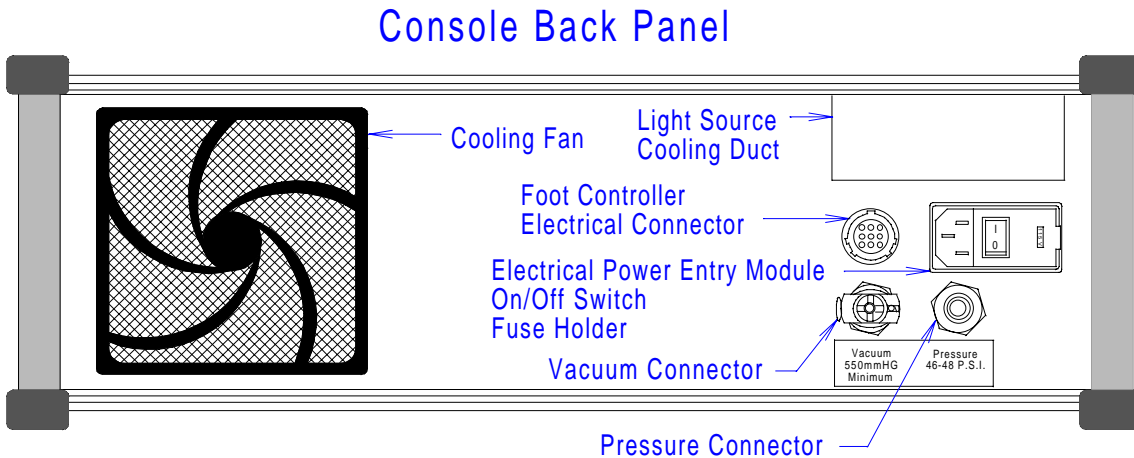


Figure 1. Syntec VitMan[®] Back Panel

The console back panel, shown in Figure 1, has the electrical connectors for the electrical power and the foot pedal and the pneumatic connectors for an external source of pressure and vacuum.


	Syntec, Inc. 733 Mansion Road Winfield, MO 63389 USA		This unit was manufactured in compliance with the following electrical safety specifications: I.E.C. 601-1, U.L. 2601
	Model: <i>VitMan</i> Voltage: 90-250VAC Power Input: 950VA Fuse: 5 x 20mm: 6.3A@250V, 10A@125V: Fast Blow	Serial Number: ##### Frequency: 50-60 Hz	I.E.C. 529 Classification: IPX0 Made in the USA ART: 1000711

Figure 2. Back Panel Label

The back panel label of the unit is shown in Figure 2. It displays the unit's serial number, model and lists the specification for the power input and the fuse(s). The Ultrasound handpiece is type B (Protectively grounded enclosure).

EQUIPMENT SETUP & OPERATION

The electrical power entry module contains a standard 3-prong, I.E.C. 320-style connector for the main electrical power, the on/off switch, and the fuse holder. The power cord supplied with the Syntec VitMan[®] has the appropriate connector for the main power source, opposite to the 3-prong connector. The internal electrical power source for the Syntec VitMan[®] is a universal switching power supply that accepts line voltage from 90 to 250 VAC and line frequency from 50 to 60 Hertz. The fuse/fuses are fast blow type. Their rating will depend on the line voltage. In the 90-130 volt range, the fuse is rated at 10 A. In the 200-250 volt range, the fuse is rated at 6.3 A.

NOTE: In most countries a single fuse is used on the “hot” conductor. The electrical power entry module provides the capability to fuse both supply lines if the power to the unit does not have a “neutral”.

The on/off switch is labeled I and 0 in a universal digital format where I = ON and 0 = OFF.

The electrical connector for the foot pedal is a keyed, 9-pin connector.

The vacuum connector allows the connection of an external source of vacuum. When an external source is desired, the VitMan needs to be configured to disable the internal vacuum pump. Two options are available. If “external vacuum” is selected the internal vacuum pump will be disabled and the user is required to connect an external source of vacuum. If “auto select” is selected the internal vacuum pump will be enabled if an external source of vacuum is not detected. See the PICK VACUUM SOURCE command on page 249 for details.



NOTE: In auto select mode the external source of vacuum **MUST** be present prior to powering up the console. Connecting the external source after the internal vacuum pump is running will not disable the vacuum pump.

The pressure connector allows the connection of an external source of pressure. When an external source is desired, the VitMan needs to be configured to disable the internal pressure compressor. Two options are available. If “external pressure” is selected the internal pressure compressor will be disabled and the user is required to connect an external source of pressure. If “auto select” is selected the internal compressor will be enabled if an external source of pressure is not detected. See the PICK PRESSURE SOURCE command on page 248 for details.



NOTE: In auto select mode the external source of pressure **MUST** be present prior to powering up the console. Connecting the external source after the internal pressure compressor is running will not disable the pressure compressor.

EQUIPMENT SETUP & OPERATION

FRONT PANEL OVERVIEW

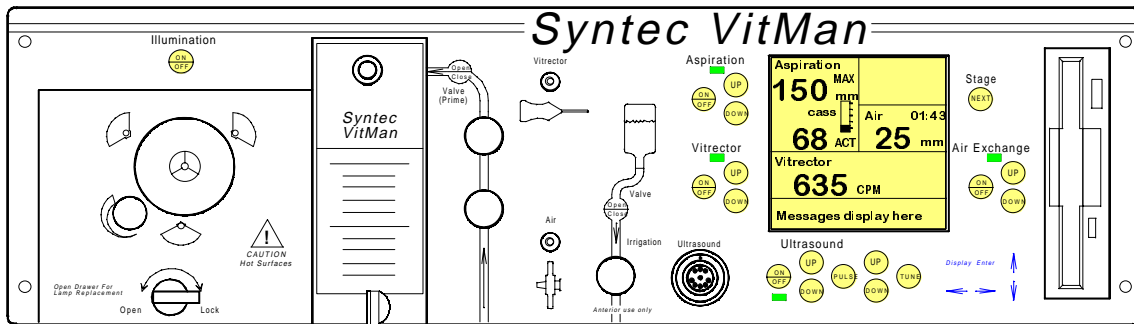


Figure 3. Syntec VitMan® Front Panel

Figure 3 shows the front panel accessory connectors and primary controls. The display controls are blue. The surgical controls and labels are yellow.

The surgical functions are: Illumination, Aspiration, Vitrector, Ultrasound, and Air Exchange. The controls for the Illumination and Air Exchange functions are independent from all other surgical function controls. The controls for the Aspiration, Vitrector, and Ultrasound functions interact.

The Vitrector and Ultrasound controls are mutually exclusive. If the Vitrector is selected, Ultrasound will be inhibited from turning on until the Vitrector is turned off. Likewise if Ultrasound is selected, the Vitrector will be inhibited from turning on until Ultrasound is turned off.

Aspiration can be activated as a stand-alone function. In addition, it is automatically activated as a support function for the Vitrector or Ultrasound.

EQUIPMENT SETUP & OPERATION

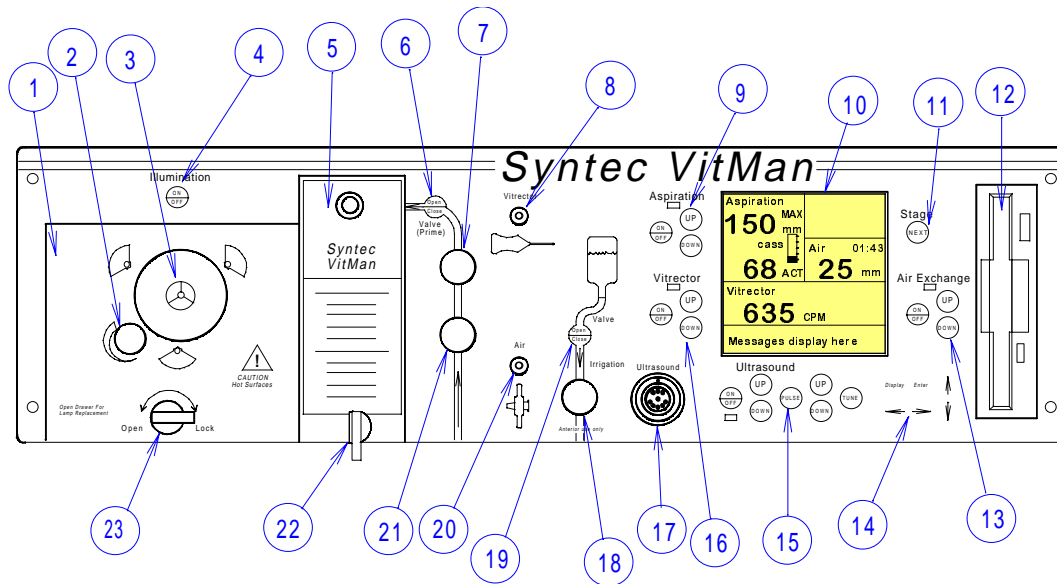


Figure 4. Front Panel Legend

FRONT PANEL LEGEND

NUMBER: DESCRIPTION

- | | |
|----|--|
| 1 | Light Source |
| 2 | Light Source Dimming / Intensity Control Knob |
| 3 | Light Source Triple Fiber Optic Cable Connector |
| 4 | Light Source ON/OFF Control Button |
| 5 | Collection Cassette |
| 6 | Aspiration Valve OPEN/CLOSE Control Button |
| 7 | Aspiration Pinch Valve |
| 8 | Vitrector Connector |
| 9 | Aspiration Control Buttons |
| 10 | Liquid Crystal Display (LCD) |
| 11 | Stage Button |
| 12 | Floppy Disk Drive |
| 13 | Air Exchange Control Buttons |
| 14 | Display Control Buttons |
| 15 | Ultrasound Control Buttons |
| 16 | Vitrector Control Buttons |
| 17 | Ultrasound Connector |
| 18 | Irrigation Pinch Valve |
| 19 | Irrigation Pinch Valve OPEN/CLOSE Control Button |
| 20 | Air Exchange Connector |
| 21 | Aspiration Reflux Valve |
| 22 | Cassette Mechanical Locking Control Knob |
| 23 | Light Source Mechanical Locking Control Knob |

Figure 4 shows the front panel legend. Moving from left to right, the first functional group is the Illumination module (1). Graphics are displayed for the three fiber optic endoillumination connections, positioned symmetrically around the circular triple connector (3). The next connector is for the aspiration

EQUIPMENT SETUP & OPERATION

(vacuum) tubing, graphically depicted beginning at the aspiration port of the collection cassette (5), then threaded through 2 circular pinch valves (7) & (21).

Immediately to the right of the aspiration pinch valves, the top connector is the positive pressure drive for the vitrectomy cutter (8). The connector has the word **“Vitrector”** printed directly above it and a graphic illustration of a vitrectomy cutter directly below it.

Directly below the vitrector connector is the positive pressure air connector for the Air Exchange function (20). The connector has an illustration of an air filter with the word **“Air”** printed directly above it.

The irrigation pinch valve (18) is located to the right of the Air Exchange air connector. This pinch valve is only used to support anterior surgical procedures. The warning **“Anterior use only”** is printed directly below the valve and the label **“Irrigation”** is printed above it. The graphic illustration shows a saline solution bottle with tubing extended through the valve.

The 9-pin circular connector for the ultrasound lens fragmentation handpiece (17) is located directly to the right of the irrigation pinch valve, with the word **“Ultrasound”** printed above it. The floppy disk drive (12) is located on the far right edge of the front panel.

Between the disk drive and the ultrasound connector is the square Liquid Crystal Display (LCD) (10), surrounded by function control buttons. The functions are labeled in yellow, counter clockwise from the top left: **“Aspiration”** (9), **“Vitrector”** (16), **“Ultrasound”** (15), and **“Air Exchange”** (13).

Six control buttons (14) are located at the lower right corner of the LCD. These buttons are labeled in blue with the words **“Display”** and **“Enter”**, and two sets of arrows, one horizontal and one vertical. In normal mode, the horizontal arrows control the LCD contrast and the vertical arrows control the LCD back light brightness. While in the utilities menu, the horizontal arrows are used to move between menus and enter/exit commands. The vertical arrows are used to traverse the menus or change a parameters value. For more details see DISPLAY & UTILITIES MENU CONTROL beginning on page 81.

The surgical procedure **“Stage”** button (11) is located at the upper right side of the LCD. This button controls the fast change from one machine setup to another during surgery. For more details on the use of the stage button, see Stage Button Operation beginning on page 78.

EQUIPMENT SETUP & OPERATION

IRRIGATION

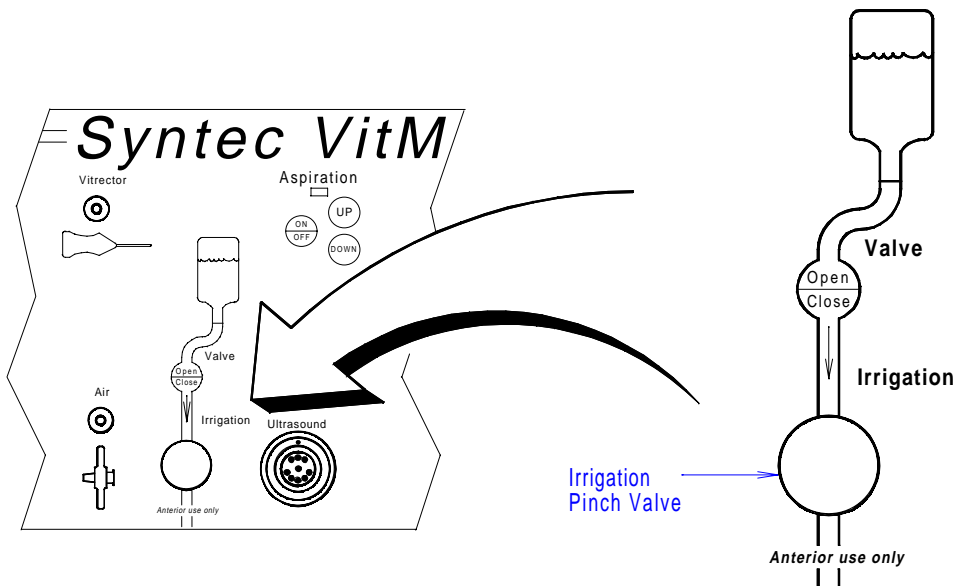


Figure 5. Front Panel Connections: Irrigation

For anterior surgical applications only, the irrigation tubing is threaded through the pinch valve shown in Figure 5. The valve is opened and closed by depressing the Open/Close button. This button is located in the center of the graphic depicting the saline solution bottle and the tubing being routed through the pinch valve.

Irrigation is normally provided by a Balanced Saline Solution (B.S.S.) bottle that is suspended open end down from an I.V. pole. See Figure 6. The fluid path is through a vented drip chamber, which is connected to the B.S.S. bottle. The tubing is routed from the drip chamber, through the console irrigation pinch valve, and finally connected to the desired surgical handpiece.

Irrigation pressure at the surgical handpiece is normally adjusted by changing the bottle height. The actual pressure depends on the relative height difference between the fluid level at the drip chamber and the surgical handpiece.

EQUIPMENT SETUP & OPERATION

Typical Anterior Irrigation Tube Routing

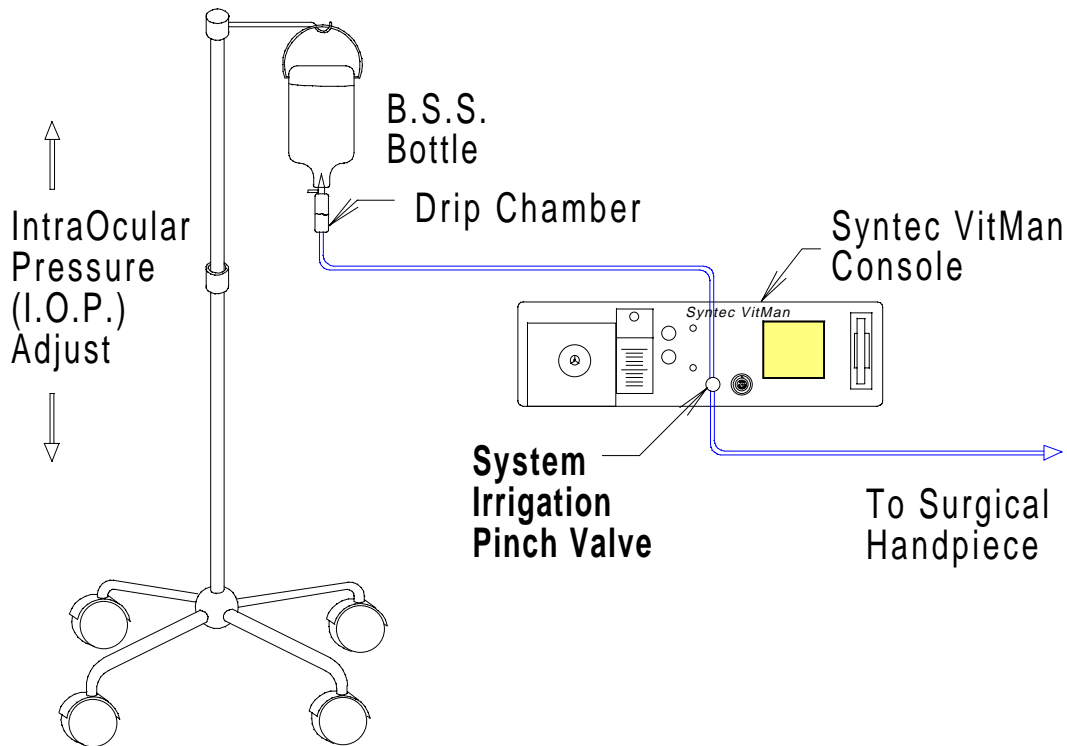


Figure 6. Tubing Setup: Anterior Irrigation

As shown in Figure 6, routing the tubing through the console irrigation pinch valve allows the Syntec VitMan[®] control system to interrupt irrigation flow when appropriate. The irrigation tubing is inserted into the pinch valve through the vertical slot located in the side of the valve. After the tubing is inserted, the valve should be closed by depressing the Open/Close button located just above the valve. The Open/Close button can be used for priming the irrigation tubing.



WARNING: The Syntec VitMan[®] must be in an **ANTERIOR** operating mode in order for the irrigation pinch valve to operate. The valve will remain open in **POSTERIOR** modes.



NOTE: In the event of an electrical power failure, the irrigation pinch valve will **OPEN**.

EQUIPMENT SETUP & OPERATION

Typical Posterior Irrigation Tube Routing

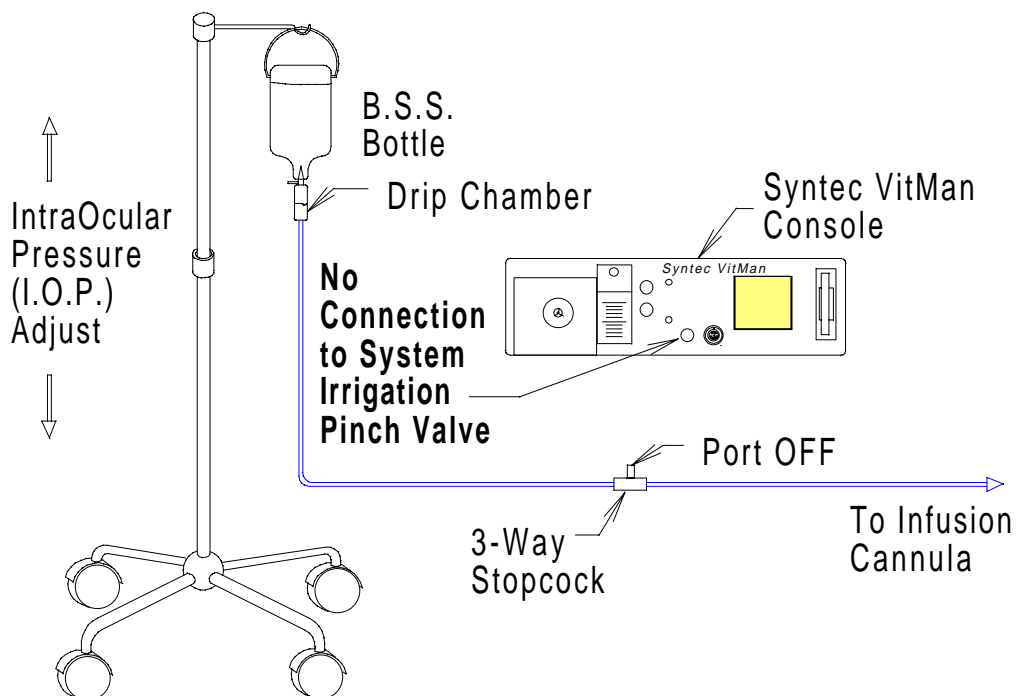


Figure 7. Tubing Setup: Posterior Irrigation

As shown in Figure 7, no connection is made to the Syntec VitMan[®] irrigation pinch valve for posterior procedures. The irrigation tubing is routed from the B.S.S. bottle through a 3-way stopcock to an infusion cannula. The I.O.P. is adjusted by changing the bottle height relative to the infusion cannula.

EQUIPMENT SETUP & OPERATION

ASPIRATION

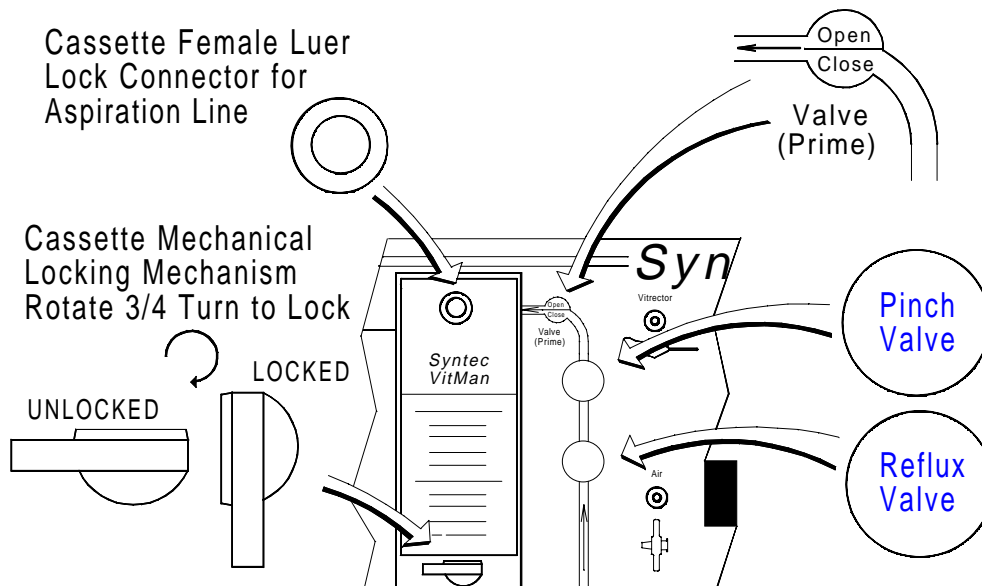


Figure 8. Front Panel Connections: Aspiration

Figure 8 shows the front panel aspiration connector of the collection cassette. It also shows the cassette locking mechanism control knob. When the knob is horizontal, the cassette is released and pushed slightly outward. To insert the cassette, slide it into the opening until the resistance from the ejector springs is felt. Rotate the locking control knob 3/4 turn clockwise to lock the cassette in place.



WARNING: Do not force the cassette into the machine. If the aspiration cassette is held against the back of the aspiration chamber, the cassette will not correctly seal. To correct, unlock then re-lock the cassette locking mechanism.

Connect the aspiration tubing to the female luer lock connector near the top of the cassette. Depress the OPEN/CLOSE button to open the pinch valve. The valve will remain open for 30 seconds. Thread the aspiration tubing through both valves via the vertical slot located in the side of the valves. Depress the OPEN/CLOSE button again to close the pinch valve and pinch the tubing.

The OPEN/CLOSE button is also used to begin the aspiration prime cycle. For details see ASPIRATION PRIMING on page 37.

No aspirated fluid contacts any permanently mounted parts of the machine.

EQUIPMENT SETUP & OPERATION



WARNING: Failure to route the aspiration tubing through both valves will cause undesirable results. The aspiration pinch valve prevents a constant “passive” aspiration caused by the positive internal eye pressure. The aspiration tubing must be routed through the aspiration pinch valve to avoid this condition. The reflux function will not operate if the aspiration tubing is not routed through the reflux valve.



NOTE: In the event of an electrical power failure, the aspiration pinch valve will CLOSE. This will eliminate passive aspiration. The reflux valve will remain open. The aspiration (vacuum) level at the cassette will revert to atmosphere.

EQUIPMENT SETUP & OPERATION

AIR EXCHANGE

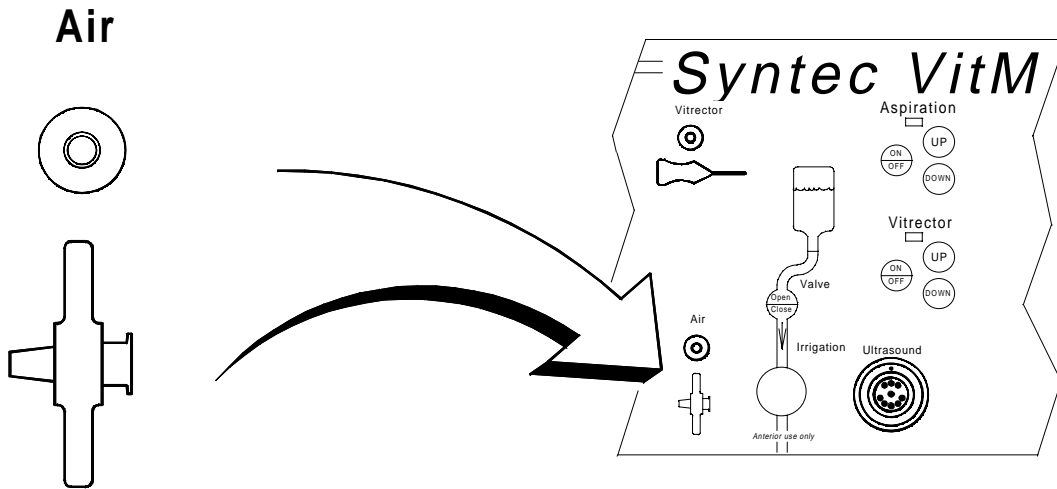


Figure 9. Front Panel Connections: Air Exchange

Figure 9 shows the connector for the air-exchange tubing just above the air filter illustration. The port labeled **Air**, provides positive air pressure from 1 mmHg to 100 mmHg.



WARNING: A 0.45 micron hydrophobic air filter **MUST** be connected to the AIR output. **NO INTERNAL FILTRATION IS PROVIDED.**

The other side of the filter is connected to a tube that is routed to the irrigation tubing set. (See Figure 10.) The irrigation tubing set will have a 3-way stopcock located between the drip chamber and the distal infusion cannula connection. The filter tube is connected to the unused part of the stopcock. The control lever of the stopcock will point toward the filter port.

EQUIPMENT SETUP & OPERATION

Fluid-Air Exchange Tube Routing

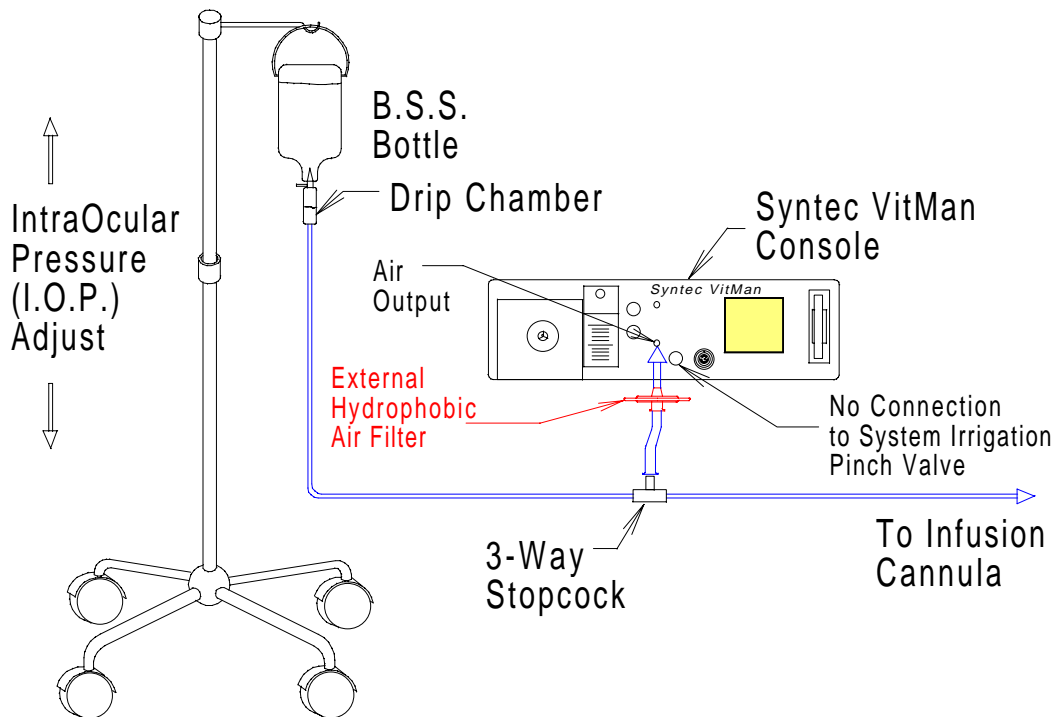


Figure 10. Tubing Setup: Fluid-Air Exchange

When air exchange is necessary, the function should be turned on. The output should be adjusted to the desired pressure. The lever on the stopcock should be turned toward the port connected to the drip chamber. This will temporarily turn irrigation off and connect the output of the air exchange to the infusion cannula.

When air is no longer required, turn the stopcock lever back toward the filter port. This will restore irrigation.



NOTE: In the event of an electrical power failure, a valve inside the console will CLOSE. This will block reverse airflow into the system. The 3-way stopcock, located in the irrigation tube set, should be immediately turned to allow irrigation fluid to maintain the intraocular pressure (IOP).

EQUIPMENT SETUP & OPERATION

VITRECTOMY

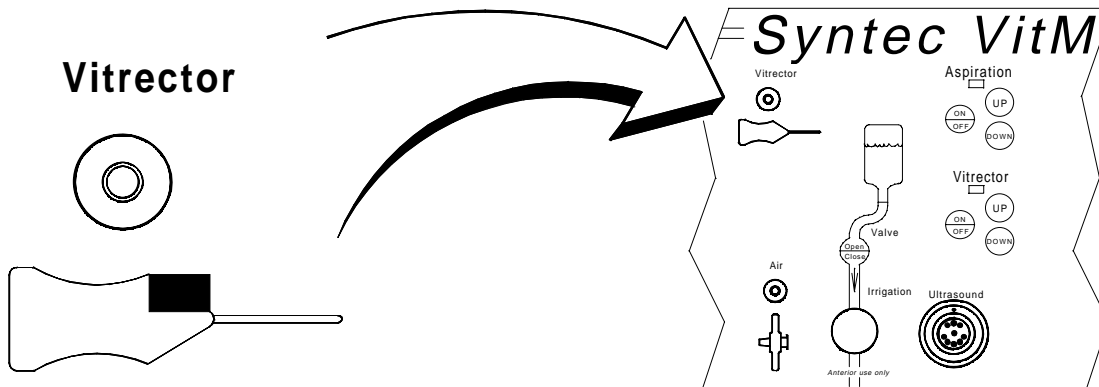


Figure 11. Front Panel Connections: Vitrectomy

Figure 11 shows the air pressure connector for the vitrector, just above the vitrector illustration and below the word **Vitrector**. Note that depending on the type of vitrector, at least two connections are required. Posterior vitrectors require one connection for aspiration, and another for cutter drive pressure. Anterior vitrectors require a third connection for irrigation fluid. Route the tubing for these connections as shown in Figure 12 and Figure 13.



WARNING: Despite precautions taken to avoid cross-connections with the different tube sets, it is physically possible. Use of different manufacturer's vitrectors or luer adapters is one possible cause. Always test the vitrector outside the eye. Connection of the drive pressure to either the aspiration or the irrigation lines could result in severe overpressure to the eye.

EQUIPMENT SETUP & OPERATION

Typical Posterior Vitrector Tube Routing

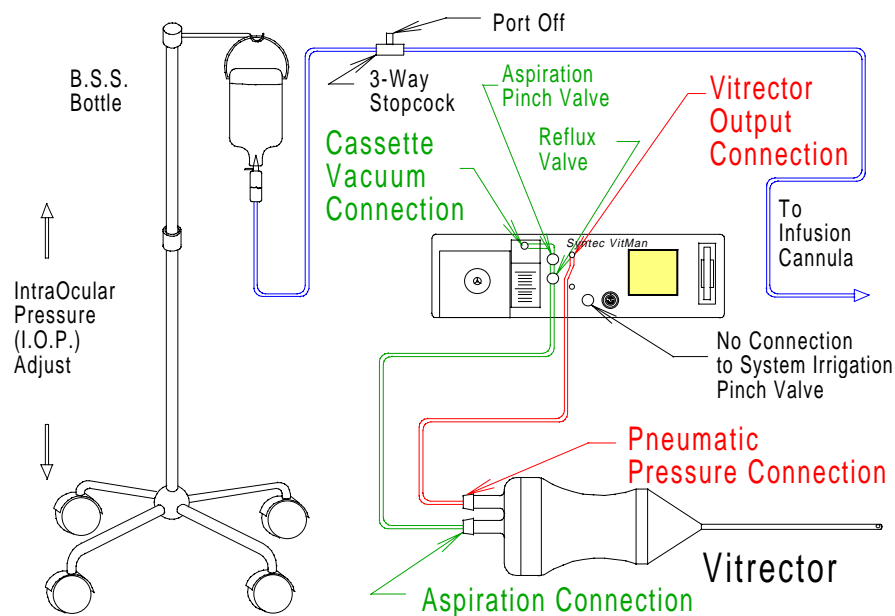


Figure 12. Tubing Setup: Posterior Vitrector

Typical Anterior Vitrector Tube Routing

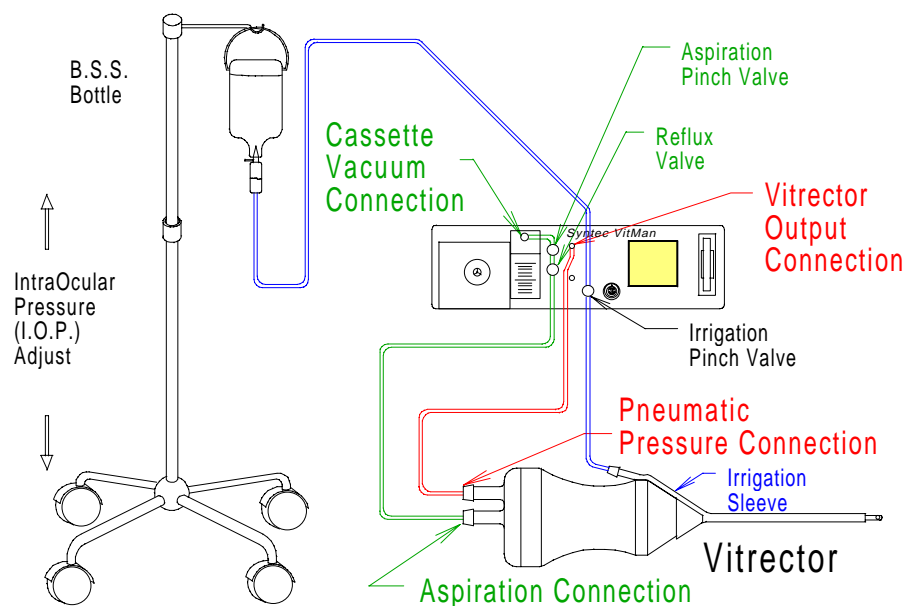


Figure 13. Tubing Setup: Anterior Vitrector

EQUIPMENT SETUP & OPERATION

ILLUMINATION

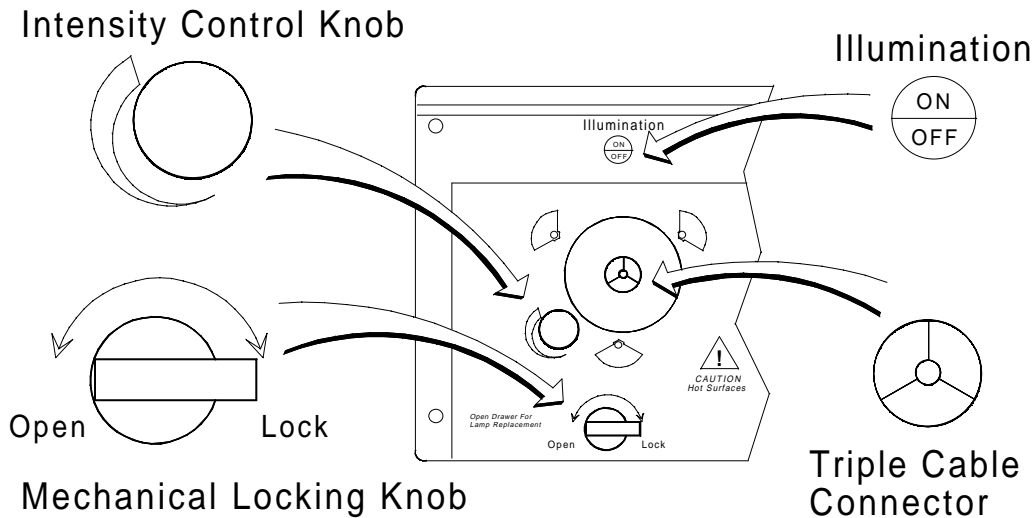


Figure 14. Front Panel Connections & Controls: Illumination

Figure 14 shows the light source connectors and controls. The ON/OFF control button is located directly above the triple cable connector. Although the capability exists to connect up to three fiber optic cables simultaneously, it is only necessary to connect a single fiber to use the light source. The ability to connect up to three fiber optic cables to the system allows the use of illuminated instruments without resorting to additional light sources.

A possible configuration would be two bare fiber illuminators (for instruments) and a traditional fiber optic cable with an integral endoilluminator probe. Although, in this instance, not all three fibers would be used simultaneously. However, all three fibers would be illuminated and ready for immediate use eliminating the necessity for changing fiber optic connections at the console.



NOTE: The Illumination function is independent from all others. If Illumination is on, pressing the ON/OFF button will turn it off. If Illumination is off, then pressing the ON/OFF button will turn it on. THERE ARE NO UP and DOWN buttons for the Illumination function. Light output intensity is controlled by the Intensity Control Knob shown in Figure 14.

The true white light dimming mechanism is activated by using the intensity control knob located just below and to the left of the triple cable connector. True white light dimming means that, as the source is dimmed, the output light is otherwise unaffected. The color temperature and output aperture (cone angle) remain the same.

EQUIPMENT SETUP & OPERATION

To connect a fiber optic cable to the console, align the connector so that it is oriented in one of the three positions shown on the graphics located around the light source output connector. See Figure 14 on page 26. Insert the small end of the connector into the receptacle. Resistance will be felt as the internal shutter is engaged. Continue to insert the connector until it bottoms out and the shutter engages the connector.

Take care not to force the connector. Misalignment of the connector with the receptacle will cause interference with the guides located between the three receptacles. To disconnect the cable, simply grasp the connector and pull outward until it disengages.

The mechanical locking knob holds the light source firmly in place in the console. In the event that a bulb burns out, this knob is used to release the light source drawer. Note that if a second bulb is already installed, it will be automatically activated when the primary bulb burns out. It is recommended that the burned out bulb be replaced (Reorder #1090) at the earliest opportunity to ensure that two good bulbs are in place to support the next surgery. See ILLUMINATION SOURCE BULB REPLACEMENT on page 94.

The surgeon may elect to change bulbs when neither bulb has burned out. First, turn off illumination, if it is on, by momentarily pressing the illumination ON/OFF button. Then press and hold the illumination ON/OFF button for 5 seconds. Initially the primary bulb will come on, then go off, the backup mechanism will give an audible indication of the switch to the backup bulb, and then the backup bulb will be illuminated.

EQUIPMENT SETUP & OPERATION

ULTRASOUND LENS FRAGMENTATION

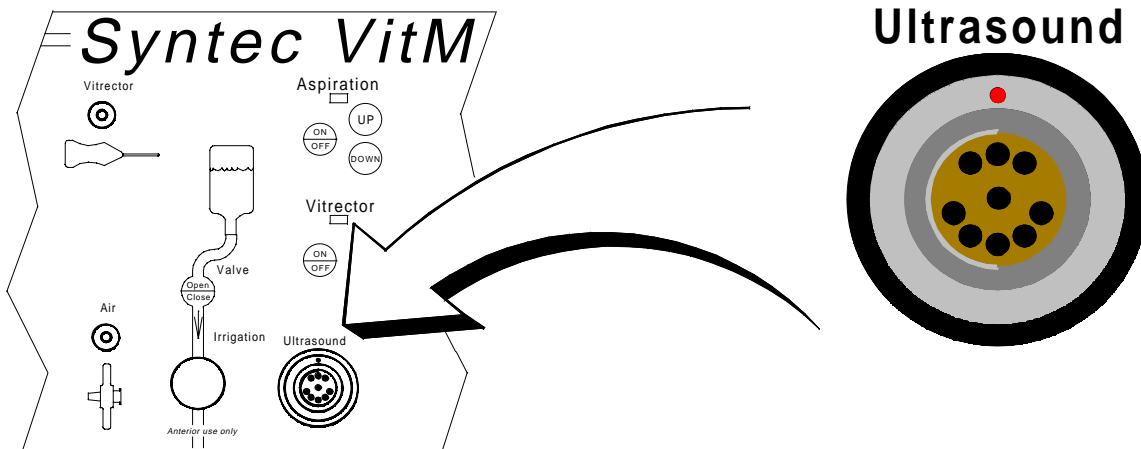


Figure 15. Front Panel Connections: Ultrasound

Figure 15 shows the electrical power connector for the ultrasound handpiece. The connector is keyed to ensure proper electrical connections between the connector pins. The posterior ultrasound handpiece is shown in Figure 60 on page 87.



WARNING: The ultrasound handpiece must be cleaned after each use and sterilized prior to each use. See CARE & HANDLING OF ACCESSORIES - ULTRASOUND HANDPIECES on page 90.

The ultrasound handpiece has a replaceable needle that is attached to the threaded opening at its front. The needle must be secured in place by using a needle wrench. Needles available from **Syntec** are provided with the appropriate wrench.



WARNING: The needle must be sterile and attached using a sterile needle wrench.

To tighten the needle, grasp the handpiece in one hand, screw the needle in place finger tight with the other hand. Then apply the needle wrench and gently rotate clockwise until the needle is firmly in place.



WARNING: Do not use pliers or other inappropriate tools to tighten the needle. The needle is very delicate and using inappropriate tools could result in scratches, bends, or other undesirable deformations. This could cause serious adverse effects on the ultrasound performance.

EQUIPMENT SETUP & OPERATION

After tightening the needle, the handpiece should be primed with sterile fluid and then tuned. The handpiece is primed in the same manner as any other surgical instrument that requires aspiration. Because the ultrasound handpiece requires tuning prior to use, the priming sequence automatically initiates the tuning process.



WARNING: When the ultrasound handpiece is tuned, the needle must be inserted into a source of sterile fluid.

If front panel display indicates that the tuning cycle is unsuccessful, recheck the physical connections to ensure proper fluid flow through the aspiration tubing connected to the cassette. Also, check the handpiece for obstructions. Tuning can be manually initiated by depressing the tune button on the console front panel. Some versions of the Syntec VitMan incorporate ultrasound electronics capable of automatically tuning the ultrasound handpiece. These versions do not have a TUNE button present on the front panel. If your system does not have a TUNE button, ignore all references to manual tuning.



NOTE: If the ultrasound power seems inadequate for lens fragmentation, check the handpiece for obstructions. If the tip has become occluded or if aspiration line has become obstructed, the lack of fluid flow through the handpiece may affect its operating characteristics.



NOTE: The following circumstances will also affect the tuning process:

- 1) Any foot pedal activity will cause the tuning process to abort.
- 2) If aspiration is off, the ultrasound will not function.
- 3) If the cassette is missing or full, the ultrasound will not function.

For more information on tuning and aspiration priming, see ASPIRATION PRIMING on page 37.

FRONT PANEL CONTROL

FRONT PANEL CONTROL: General Information

Four surgical functions are controlled by ON/OFF and UP or DOWN buttons in close proximity with the liquid crystal display on the front panel. The control of these functions is very similar. The functions are: **ASPIRATION**, **VITRECTOR**, **ULTRASOUND**, and **AIR EXCHANGE**. For example, see Figure 16 on page 32.

Each of these functions is selected by depressing the ON/OFF button just below the function label on the front panel. When the function is selected, the rectangular LED indicator light will come on, function-mode-specific alphanumeric and symbolic indications will appear in a blocked region of the display area, and a message will appear in the message display area at the bottom of the display. If the function is ready to operate, the LED will light green. Otherwise the LED will light red and warning or error messages will appear in the bottom line of the LCD display.

In general, repeated selections of the ON/OFF button will advance through the available modes for the particular function. With ultrasound, for example, four modes are available. The mode advances from Posterior Frag, Anterior Linear Phaco, Anterior Fixed Phaco, Anterior Frag, and OFF. In addition, the alphanumeric and symbolic indications will change with the selection of either a Posterior or Anterior surgical procedure.

The limits for the function, maximum aspiration, vitrectomy cut rate, maximum ultrasound power level, and air exchange pressure, are selectable by depressing the UP or DOWN buttons to the right of the ON/OFF button.

Illumination is another principal function. Its control is located in close proximity to the fiber optic connectors at the front of the light source, as shown in Figure 14 on page 26.

FRONT PANEL CONTROL: Relative to Display Indications

The Syntec VitMan[®] front panel display controls fall into two major categories.

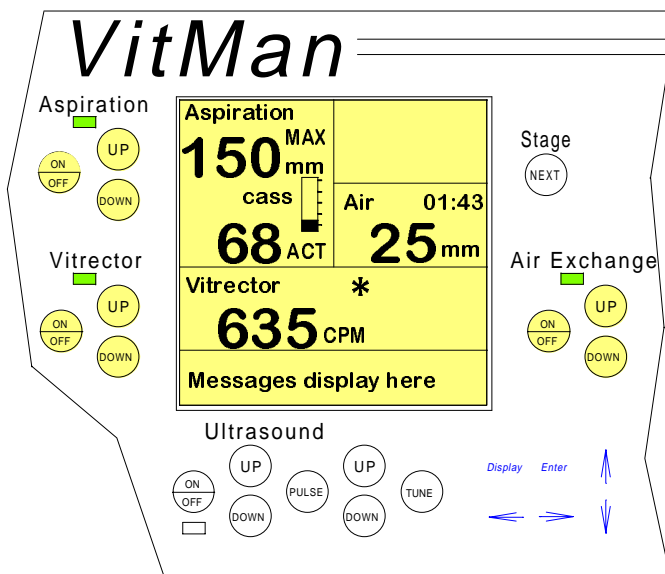
The first category of display controls involves the direct control over surgical functions. Direct control in this context means that the operator pushes a function control button and the machine responds with some action relative to a surgical function. The display provides an indication of which functions, modes, and parameters have been selected and what state the machine surgical instruments and drive mechanisms have assumed in response to those selections.

The surgical functions Aspiration, Vitrector, and Ultrasound may be energized to support either Posterior or Anterior procedures. Because the parameter control configurations for these functions and their modes differ between Posterior and Anterior surgery, the appearance of the display will also differ. Illumination and Air Exchange can also be energized for both Posterior and Anterior procedures. Since their parameter control configurations do not differ between Posterior and Anterior surgery, their displays do not differ.

The second category affects items that are not directly controlling the surgical functions of the machine. Since these display controls will not be used as frequently as the surgical function controls, they have been colored blue to allow the operator to focus on the yellow controls during surgery. The function of the blue display controls will be described in the DISPLAY & UTILITIES MENU CONTROL section of this manual, beginning on page 81.

EQUIPMENT SETUP & OPERATION

POSTERIOR DISPLAY: Vitrector Active with other Surgical Functions



**Figure 16. Posterior Controls & Indications:
Vitrector Active**

Figure 16 shows the active display area where four of the five surgical functions which support Posterior surgery are located. Illumination also supports Posterior surgery. If the illumination surgical function is enabled, and the ultrasound and vitrector surgical functions are off, the bulb hours and an indication of the illuminated bulb will be displayed. If either the vitrector or ultrasound surgical functions are on, an active illumination surgical function will be indicated by an asterisk (*) appearing in the ultrasound or vitrector area of the LCD display.

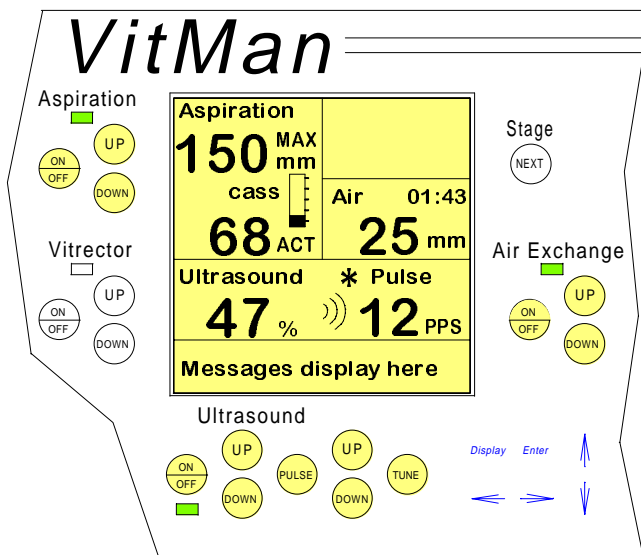
The operation of the vitrector surgical function may be customized to match the style of vitrector being used. If a vitrector style is chosen, the reorder number will display in the upper right corner of the vitrector area of the LCD display. If the selected vitrector style is used for more than one vitrector, the each reorder number will display for two seconds before changing to the next. If the custom style is chosen, the text "Cust" will be displayed. The vitrector style can be selected using the utilities menu, see PICK VITRECTOR STYLE, BY REORDER NUMBER on page 146.

In this figure the Vitrector is shown active with two other surgical functions, Aspiration and Air Exchange. These three are highlighted in yellow. The Ultrasound is not active and is not highlighted. The Vitrector and Ultrasound are mutually exclusive functions, that is only one of the two may be active at any given time. The Air Exchange function is independent from all others.

For illustration purposes, the ON/OFF, UP, DOWN buttons and the rectangular LED indicator are all shown highlighted to indicate which functions are active. The LED will be GREEN when operating conditions are within normal parameters. The LED will be RED when operating conditions are in an alarm state. A corresponding warning or error message will be displayed whenever the LED is RED.

EQUIPMENT SETUP & OPERATION

POSTERIOR DISPLAY: Ultrasound Active with other Surgical Functions



**Figure 17. Posterior Controls & Indications:
Ultrasound Active**

Figure 17 shows the active display area where four of the five surgical functions which support Posterior surgery are located. Illumination also supports Posterior surgery. If the illumination surgical function is enabled, and the ultrasound and vitrector surgical functions are off, the bulb hours and an indication of the illuminated bulb will be displayed. If either the vitrector or ultrasound surgical functions are on, an active illumination surgical function will be indicated by an asterisk (*) appearing in the ultrasound or vitrector area of the LCD display.

In this figure the Ultrasound is shown active with two other functions, Aspiration and Air Exchange. These three functions are highlighted in yellow. The Vitrector is not active and is not highlighted. The Ultrasound and Vitrector are mutually exclusive functions. The Air Exchange function is independent from all others.

For illustration purposes, the ON/OFF, UP, DOWN buttons and the rectangular LED indicator are all shown highlighted to indicate which functions are active. The LED will be GREEN when operating conditions are within normal parameters. The LED will be RED when operating conditions are in an alarm state. A corresponding warning or error message will be displayed whenever the LED is RED.

Notice also that the PULSE button on the Ultrasound is also highlighted. With PULSE mode selected, the display also shows the pulse rate for the ultrasound handpiece. The TUNE button manually activates the ultrasound handpiece tuning cycle. However, some versions of the Syntec VitMan incorporate ultrasound electronics capable of automatically tuning the ultrasound handpiece. These versions do not have a TUNE button present on the front panel. If your system does not have a TUNE button, ignore all references to manual tuning.

Four ultrasound modes are available: 1) Posterior Frag, 2) Anterior Linear Phaco, 3) Anterior Fixed Phaco, and 4) Anterior Frag. These four modes are activated sequentially by repeated depressions of the ultrasound function ON/OFF button.

POSTERIOR ASPIRATION

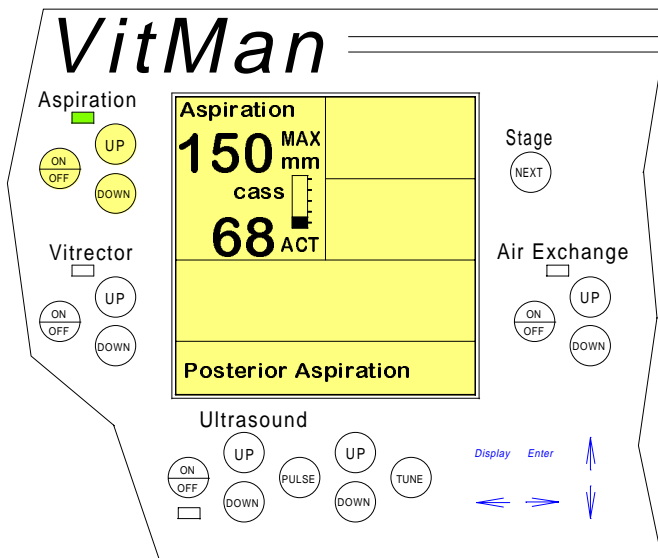


Figure 18. Posterior Controls & Indications: Aspiration

Figure 18 shows the Aspiration function selected in Posterior mode. For illustration purposes, the ON/OFF, UP, DOWN buttons and the rectangular LED indicator are all shown highlighted in yellow to indicate that Aspiration is active.

The LED will be GREEN when operating conditions are within normal parameters. The LED will be RED when operating conditions are in an alarm state. A corresponding warning or error message will be displayed whenever the LED is RED.

Without vitrector or ultrasound functions selected, depressing the aspiration function ON/OFF button the first time will result in Posterior Aspiration mode. This mode has linear aspiration control **without** console irrigation pinch valve control. The message at the bottom of the display will read "Posterior Aspiration". Depressing the aspiration function ON/OFF button a second time will result in Anterior Aspiration mode. This mode has linear aspiration control **with** console irrigation pinch valve control. The message at the bottom of the display will read "Anterior Aspiration". Depressing the aspiration function ON/OFF button a third time will turn off aspiration.

With either vitrector or ultrasound functions selected, turning on aspiration by depressing the aspiration function ON/OFF button will result in an appropriate aspiration mode to support the selected vitrector or ultrasound function mode. Depressing the aspiration function ON/OFF button a second time will turn off aspiration. In this context, aspiration becomes a slave or secondary function to vitrector and ultrasound, which are master or primary functions.



WARNING: When active, the vitrector and ultrasound function modes override the aspiration function mode. If the vitrector or ultrasound function is in a posterior mode, then aspiration will function in a posterior mode. If vitrector or ultrasound function is in an anterior mode, then aspiration will function in an anterior mode (by adding console irrigation pinch valve control).

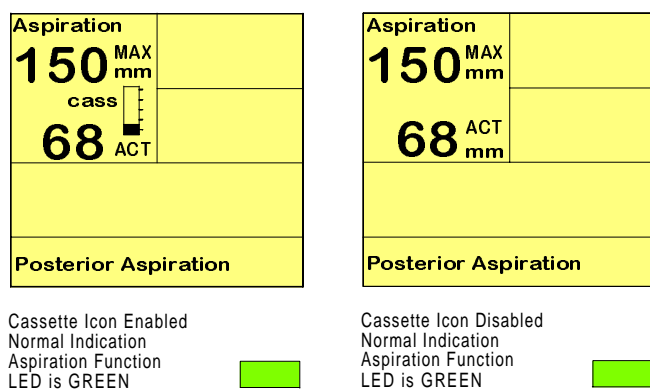
EQUIPMENT SETUP & OPERATION

In upper left portion of the display area, two numbers appear below the word Aspiration. The top number is the maximum aspiration limit selected, in mmHg. Maximum is indicated by MAX, and the limit can be selected by using the UP or DOWN buttons to any value between 0 and 500 mmHg in increments of 5 mmHg. The lower number is the actual aspiration (vacuum) being generated at the cassette and being applied to the aspiration tube set for whatever instrument is in use. In the display area, the actual aspiration vacuum level is indicated by ACT. For example, the vitrector, ultrasound handpiece, and I/A handpiece all have aspiration connectors.



NOTE: With the MAX set to 0, the foot pedal depression only opens the aspiration pinch valve. The collection cassette vacuum level remains at atmosphere. This results in an apparent vacuum in the eye equivalent to the height difference between the irrigation B.S.S. bottle and the cassette. This obviates the requirement for passive aspiration handpieces (those with a hole in the side of the aspiration path in the handpiece). Although that type of handpiece can still be used with the system.

In the Posterior configuration, foot pedal control of aspiration is linear, so the ACT value will change with foot pedal motion. Some ultrasound and vitrector modes use fixed aspiration. While in fixed aspiration modes while using the ultrasound, only the selected aspiration value will be displayed. See Figure 33 on page 50.



**Figure 19. Displays: Posterior Aspiration:
Normal Indications**

Figure 19 shows a set of normal aspiration displays with and without the cassette icon visible. The message display area will display a combination of the surgical function modes selected and warning and error (alarm) messages. For example, when the operator first depresses the Aspiration ON/OFF button the message "Posterior Aspiration" will appear and remain for 5 seconds. When the Aspiration ON/OFF button is depressed a second time, the message

"Anterior Aspiration" will appear (see Figure 20). Irrigation valve control is shown by the addition of a small circle icon located between the two aspiration values. This icon has an "open" center when the irrigation valve is open (see Figure 20) and a filled "closed" center when the valve is closed. When the operator depresses the Aspiration ON/OFF button for the third time, the aspiration area of the display will go blank.

EQUIPMENT SETUP & OPERATION

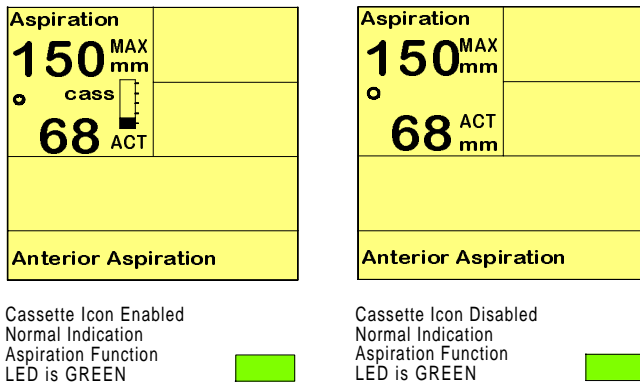


Figure 20. Displays: Anterior Aspiration: Normal Indications

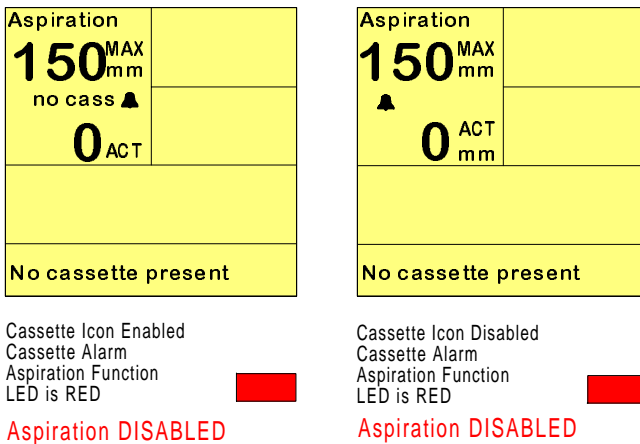


Figure 21. Displays: Posterior Aspiration: Cassette Alarm

Figure 21 shows a set of cassette alarm displays with and without the cassette icon visible. The presence of the cassette icon is selectable by the user, using the utilities menu (see CASSETTE ICON IS ON/CASSETTE ICON IS OFF on page 177). When visible on the display, the icon indicates that the cassette is present and how much fluid it contains.

If the cassette is not present, the cassette icon will not be present, and the error message “No cassette present” will appear in the message display area. If the cassette is present but not seated properly, the messages “Low vacuum level” and “Please lock cassette” will appear in the message display area. Any alarm condition relative to aspiration will cause the aspiration function LED to turn from green to red when the aspiration function is on.

ASPIRATION PRIMING

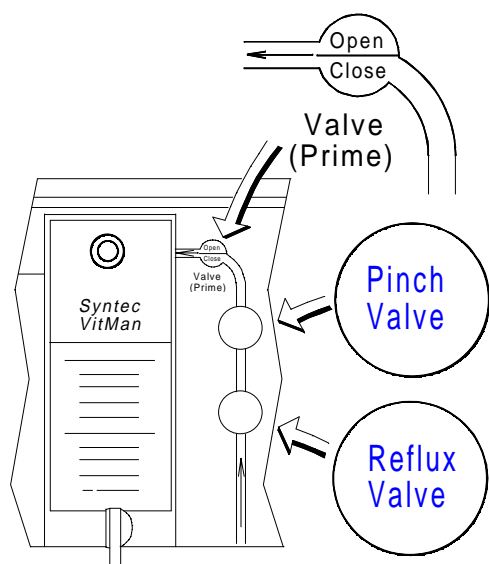


Figure 22. Controls: Aspiration Priming

Priming is necessary to fill the aspiration tubing with fluid before using a surgical instrument connected to the tubing. This ensures a smooth, controllable suction, and enhances the performance of reflux.

The button that controls aspiration priming is located near the aspiration pinch valve, see Figure 22. The button has the label Open/Close printed on it, and the label Valve (Prime) printed directly below it. When it is depressed and held for ½ second, one of the displays shown in Figure 23 will appear. The numerical value of aspiration is the vacuum level used for priming. (NOTE: This value may be changed via the utilities menu, see VITRECTOR LEVEL on page 166 or ULTRASOUND LEVEL on page 169.)

Two priming modes are available. The default mode is the Timed Prime Mode. The other mode is Continuous Prime Mode. The desired mode is selectable using the utilities menu (see PRIME MODE SELECT on page 165).

Timed Prime Mode is an automatic function, so that when prime is selected, the vacuum will be present for a predetermined amount of time after the aspiration valve Open/Close button is released, and then shut off automatically. The specific amount of time is selectable by the user via the utilities menu (see VITRECTOR DURATION on page 166 or ULTRASOUND DURATION on page 168).

When the aspiration valve Open/Close button is depressed for ½ second and then released, the timed prime cycle begins. The cycle time and aspiration level used are a function of the current vitrector and ultrasound state. If both are off, the settings for vitrector are used. The factory default vacuum setting for vitrector aspiration priming is 400 mmHg for 12 seconds, as shown in . The ultrasound utilizes an aspiration of 200 mmHg for 4 seconds. The vacuum level can also be changed by the user via the utilities menu (see VITRECTOR LEVEL on page 166 or ULTRASOUND LEVEL on page 169).

If Vitrector is selected, the cassette will draw fluid for a specified number of seconds (12 seconds). The vitrector will be activated at 600 cpm during the final

EQUIPMENT SETUP & OPERATION

10 seconds before priming automatically stops. If ultrasound is selected, and auto tune is enabled, the cassette will draw fluid for a specified number of

seconds (4 seconds). The ultrasound handpiece tuning sequence will then be activated before priming automatically stops.

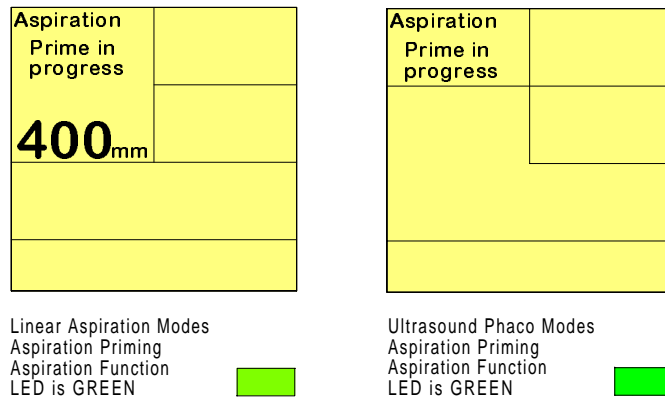


Figure 23. Displays: Aspiration: Priming

Figure 23 shows the display as it will appear while the aspiration system is priming. The display on the left will be present when the delivered vacuum level is present on the display, for example in linear aspiration modes. The display on the right will be present in ultrasound phaco modes.



WARNING: The instrument aspiration port must be submerged in sterile B.S.S. during the entire priming sequence for the process to be effective.

The timed prime cycle can be stopped manually by depressing the aspiration valve Open/Close button. If vitrector is selected and the vitrector is cutting, it will stop cutting. If ultrasound is selected and the ultrasound handpiece is tuning then the tuning cycle will complete.

Another way to stop the prime cycle is by foot pedal activity. This will also stop the vitrector from cutting and it will stop the ultrasound handpiece from tuning.

Continuous Prime Mode is activated by depressing the aspiration valve Open/Close button, and holding it for ½ second. The continuous prime cycle will start and it will only be terminated by depressing the aspiration valve Open/Close button again, by foot pedal activity, or by over filling the cassette.



NOTE: While in continuous mode, the current state of the vitrector or ultrasound functions will only have an effect on the prime aspiration level. If the vitrector is on, no auto cut will occur. If the ultrasound is on, no auto tune will occur, even if auto tune is selected.

EQUIPMENT SETUP & OPERATION

CASSETTE FLUID LEVEL

With aspiration in use, the cassette fluid level will rise as the vacuum draws fluid into the cassette. Notice also, that the icon fluid level also rises in approximately the same proportion as the actual fluid in the cassette.

The cassette icon display is just additional method for the user to check the fluid level in the cassette. The icon may be turned on or off by using the utilities menu (see CASSETTE ICON IS ON/CASSETTE ICON IS OFF on page 177). The factory default setting for the cassette icon display is ON. Regardless of whether the cassette icon is displayed, the system tracks the cassette fluid level internally.

In addition to the cassette icon, the collection cassette has a graticule located on its front. This graticule is illuminated from behind to allow direct visualization of the fluid level. Intensity of the cassette illumination is adjustable through the utility menu.

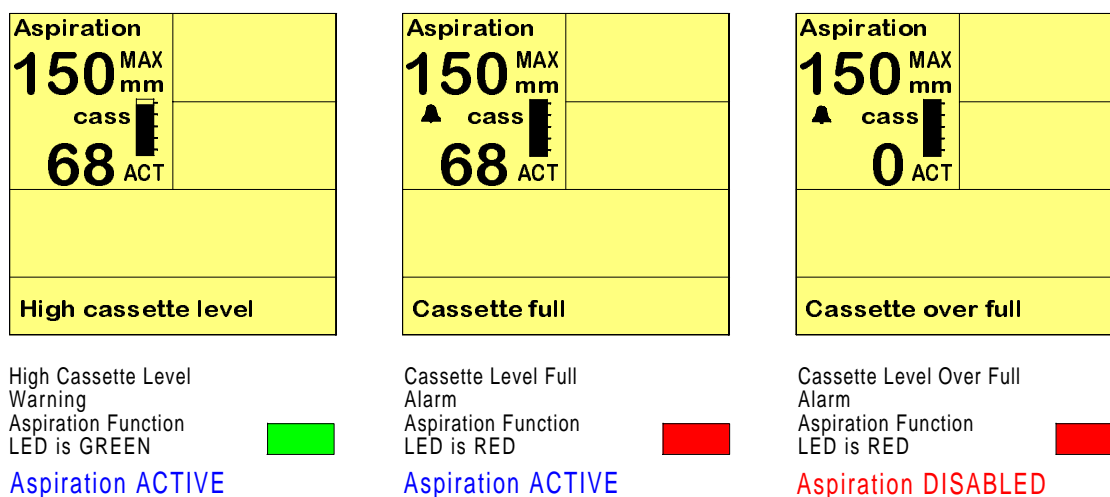


Figure 24. Displays: Cassette Fluid Level Indications

When the fluid level reaches between approximately 250cc and 300cc, a warning tone will sound and the warning message “High cassette level” will appear, as shown in Figure 24. When the level reaches between approximately 300cc and 325cc, another alarm will sound and the message “Cassette full” will appear. At this point, the aspiration function LED will change from green to red. If the cassette level rises above approximately 325cc, another alarm will sound and the message “Cassette over full” will be displayed. At this point, aspiration will stop functioning. A new cassette must be inserted into the console to resume using aspiration.

EQUIPMENT SETUP & OPERATION

VACUUM MONITORING

The aspiration control system tracks the actual vacuum at the collection cassette and the vacuum source and issues an alarm if the available vacuum falls below certain thresholds.

The first illustration on the left in Figure 25 shows the low vacuum level warning. This warning is issued when the internally tracked source vacuum falls below a threshold such that the full range of user commanded vacuums is not available. This situation does not constitute a complete aspiration system failure. For example, the aspiration system may be fully functional up to 400 mmHg, but if the user were to attempt to command a level at 500 mmHg, it would not be available.

The second illustration on the left in Figure 25 shows the cassette lock alarm. This alarm is issued when the internally tracked source vacuum falls below a threshold such that the likelihood exists that the cassette is not firmly locked in place. This situation does represent an aspiration system alarm condition. However, it is possible to be rectified by checking the cassette position within the console and locking it in place. If the “Please lock cassette” message does not go away after locking the cassette in place, then contact technical support for assistance.

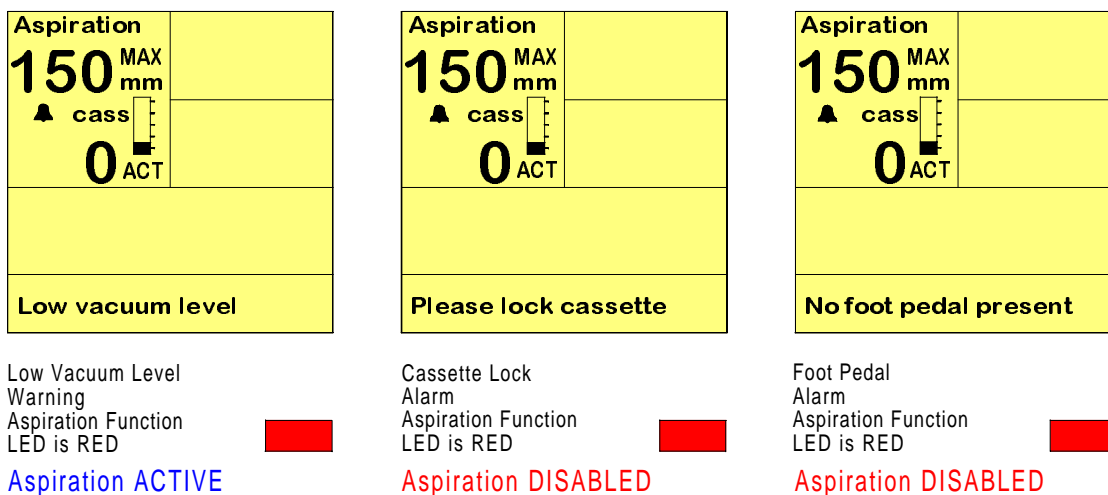


Figure 25. Displays: Vacuum Level & Foot Pedal Alarms

During a low vacuum level warning, the indications of actual aspiration may be fully within an acceptable range for the present user commanded vacuum levels. This is not likely when the cassette lock alarm is issued. This situation would require some type of breach in the integrity of the tubing or cassette connections, either external or internal to the console.

If the console control system cannot communicate with the foot pedal, an alarm will sound and a message will be displayed as shown on the right in Figure 25.

AIR EXCHANGE

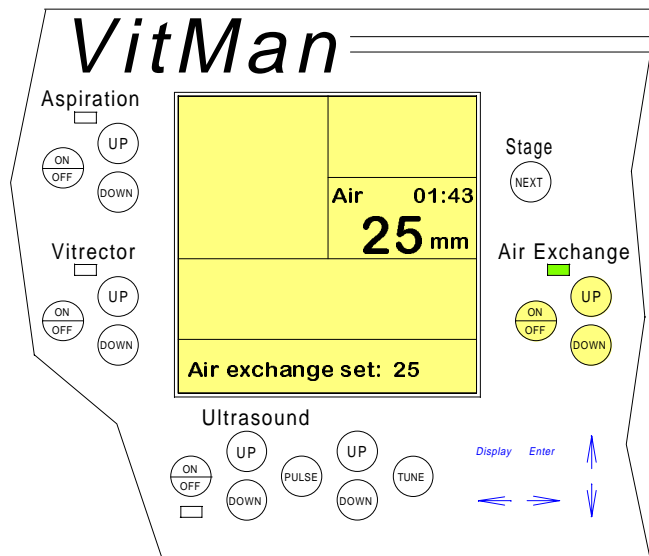
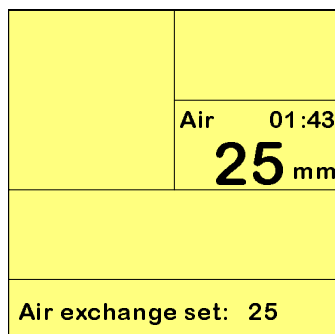


Figure 26. Front Panel Controls & Indications: Air Exchange

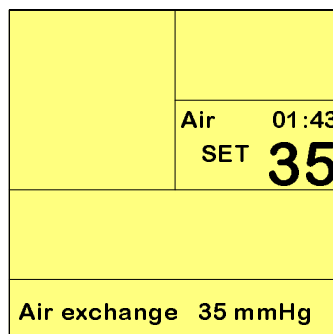
Air exchange is labeled “Air Exchange” on the front panel. Figure 26 shows the appearance of the display for this function. For illustration purposes, the ON/OFF, UP, DOWN buttons and the LED just below the Air Exchange label are highlighted to indicate that the mode is active.

On the right side of the display area near the middle, the word “Air” is displayed with a number indicating the positive pressure applied at the connection port on the front panel. The value of the positive pressure is displayed in mmHg, indicated by “mm”. The

maximum available pressure for air exchange is 100 mmHg, selectable by using the UP or DOWN buttons on the front panel. The incremental control is 1 mmHg.



Fluid - Air Exchange
Normal Indication
Air-Exchange Function
LED is GREEN



Fluid - Air Exchange SET
Display Indication
Air-Exchange Function
LED is GREEN

The display to the left in Figure 27 shows the normal indication for Air Exchange. The large characters show the output pressure. The small numerical characters above the output pressure are the over pressure time indicator. The bottom line shows the current set point.

Figure 27. Displays: Air Exchange Normal and SET Function

is activated by using the UP and DOWN control buttons. The large characters show the set point, while the bottom line shows the current output pressure. This will revert to the normal display 2 seconds after set point modification is complete.

The display to the right in Figure 27 shows the set function indication, which

EQUIPMENT SETUP & OPERATION

The warning and error messages displayed with the Air Exchange function are shown in Figure 28. The Air Exchange function LED will change from green to red indicating an alarm condition.

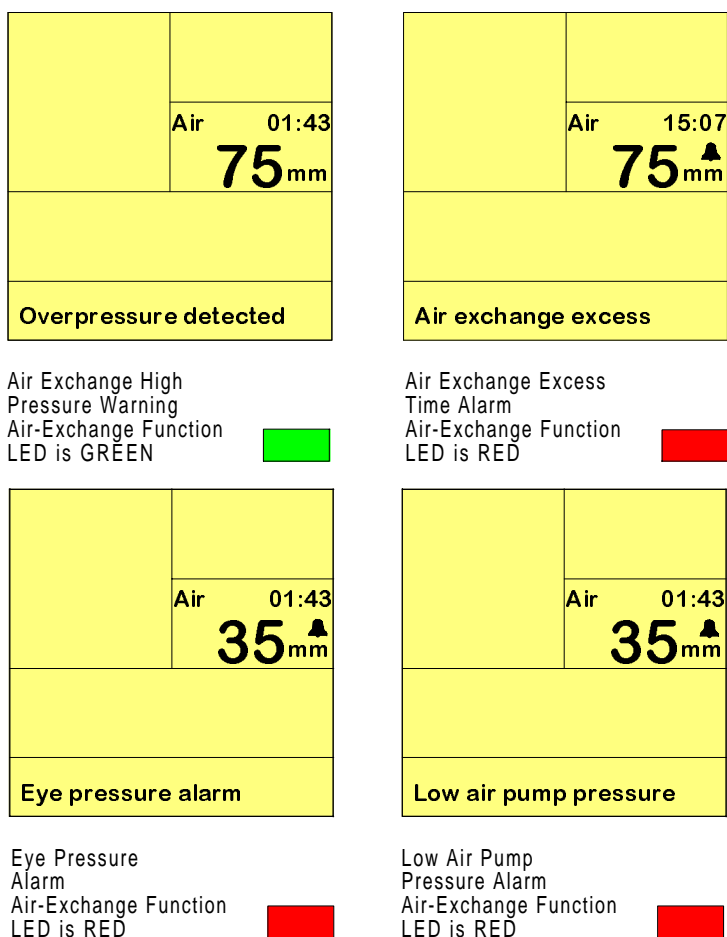


Figure 28. Displays: Air Exchange Warnings

threshold prior to expiration of the timer clear delay, the overpressure timer will not be cleared and will continue to increment. The overpressure timer is also cleared when the function is enabled (OFF then ON). Automatic clearing of the overpressure time may be disabled by setting the timer clear delay to zero.

The overpressure threshold, excess time warning and timer clear delay are adjusted using the utilities menu (see the AIR EXCHANGE VALUES menu entries beginning on page 130). The factory default warning pressure is set at 70 mmHg. The factory default warning time limit is 15 minutes. The factory default for the timer clear delay is 15 seconds.

The display at the bottom left in Figure 28 is the eye pressure alarm. If the pressure sensor reading varies by more than ± 5 mmHg from the user setting, the

The display at the top left in Figure 28 is the overpressure warning. If the requested pressure exceeds the user set threshold, the warning will be displayed, and the overpressure time will increment.

The display at the top right in Figure 28 is the excess time warning. When the requested pressure of the air exchange has been overpressure for a time longer than the user setting, the warning will be displayed and an alarm sounded. When the requested pressure falls below the set threshold, the overpressure time will stop incrementing. If the pressure remains below the threshold, the overpressure time will be cleared when the timer clear delay expires. If the pressure exceeds the

EQUIPMENT SETUP & OPERATION

alarm will be displayed.

The display at the bottom right in Figure 28 is the low air pump pressure warning. This is a situation where the pump pressure is not high enough to meet the demand of the pressure setting. When this occurs, the alarm will be displayed.



NOTE: The Air Exchange function is independent from all others. If Air Exchange is on, pressing the ON/OFF button will turn it off. If Air Exchange is off, then pressing the ON/OFF button will turn it on. The UP and DOWN buttons are active at all times.

VITRECTOMY: Posterior & Anterior

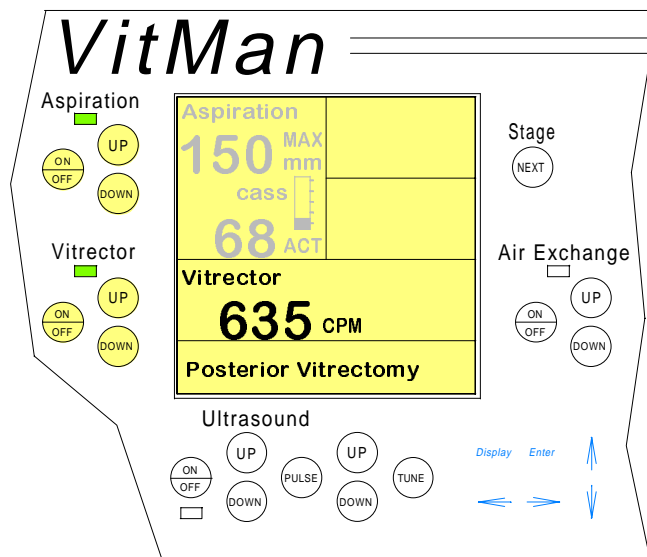


Figure 29. Front Panel Controls & Indications: Vitrectomy

Figure 29 shows the display and control buttons for using the vitrector. The control and display will be virtually the same whether using the Posterior or Anterior vitrector. The only difference will be in the message displayed when activating the ON/OFF button and the irrigation valve icon.

Five vitrector modes are available:

- 1) Posterior Vitrectomy
- 2) Anterior Vitrectomy
- 3) Posterior Linear Rate
- 4) Anterior Linear Rate
- 5) Posterior Scissors

These five modes are activated sequentially by repeated depressions of the vitrector function ON/OFF button. The displayed message will read “Posterior Vitrectomy” after the vitrector ON/OFF button is depressed once. The aspiration function will automatically turn on simultaneously with the vitrector function.

When the vitrector ON/OFF button is pressed a second time, the displayed message will read “Anterior Vitrectomy” and the irrigation valve icon will also display. The irrigation valve icon is centered at the top of the vitrector display area. If the irrigation valve is closed, a filled circle will be displayed. If the irrigation valve is open, an empty circle will be displayed.

When the vitrector ON/OFF button is pressed a third time one of two actions will take place. If linear cut rate modes are disabled, the vitrector surgical function will be disabled. If the linear cut rate modes are enabled, the displayed message will read “Posterior Linear Rate”. In linear cut rate modes the vitrector cut rate will change linearly with foot pedal position. As the foot pedal is depressed the cut rate will begin with the maximum cut rate and decrease linearly to the minimum cut rate. The minimum cut rate is reached when the foot pedal is fully depressed. The utilities menu can be used to enable or disable the linear cut rate modes (see LINEAR MODES MISSING/LINEAR MODES ENABLED on page 137).

In linear cut rate modes the aspiration surgical function will be in fixed aspiration mode. In fixed aspiration mode the vacuum level will be at the selected value

EQUIPMENT SETUP & OPERATION

after the aspiration rise time has expired. The aspiration rise time specifies the length of time for the vacuum level to reach the desired level. The vacuum level will rise linearly over the duration specified. The aspiration rise time can be adjusted using the utilities menu (see ASPIRATION RISE TIME on page 127).

If linear cut rate modes are enabled and the vitrector ON/OFF button is pressed a fourth time, the displayed message will read “Anterior Linear Rate”. In anterior linear rate mode, the action of the vitrector surgical function is identical to posterior linear rate mode with the exception that the irrigation valve icon will be displayed and the irrigation valve will be active.

Because of the irrigation fluid control requirement for the Anterior vitrector modes, the foot pedal control will be slightly different. The initial downward motion on the foot pedal will open the irrigation pinch valve before the aspiration is activated.



NOTE: The vitrector mode (anterior or posterior) takes priority over the aspiration mode. If the aspiration mode is set to anterior and then the vitrector mode is set to posterior, the aspiration mode will automatically change to posterior and the irrigation pinch valve control will be inactive.



NOTE: The last vitrector mode selected (anterior or posterior), is the current mode regardless of any previous mode selections.

It is possible to operate the vitrector without any aspiration. If the aspiration function is not turned on, or temporarily turned off, the vitrector will still operate, without the aspiration pinch valve opening. This allows for the rare occasion when aspiration is not desired, but the vitrector is.

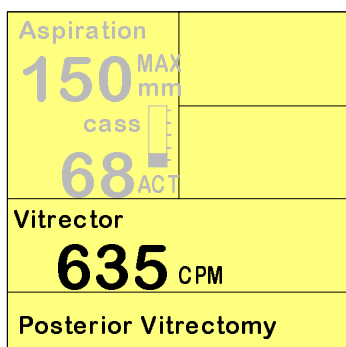
The operation of the vitrector surgical function may be customized to match the style of vitrector being used. If a vitrector style is chosen, the reorder number will display in the upper right corner of the vitrector area of the LCD display. If the selected vitrector style is used for more than one vitrector, the each reorder number will display for two seconds before changing to the next. If the custom style is chosen, the text “Cust” will be displayed. The vitrector style can be selected using the utilities menu, see PICK VITRECTOR STYLE, BY REORDER NUMBER on page 146.

Normal cut rate adjustment is activated by using the UP and DOWN control buttons next to the vitrector ON/OFF button. The cut rate is adjusted in 5 CPM increments from 5 CPM to 2000 CPM. In linear cut rate modes this adjustment specifies the maximum cut rate. The minimum cut rate for linear cut rate modes is adjusted using the utilities menu (see MINIMUM CUT RATE on page 136).

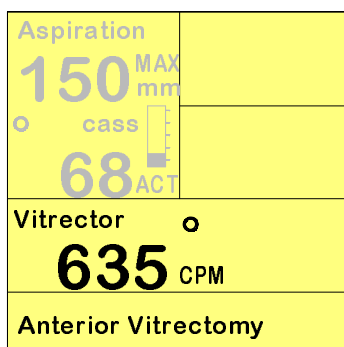
To activate the single cut mode, use the DOWN control button to reduce the cut

EQUIPMENT SETUP & OPERATION

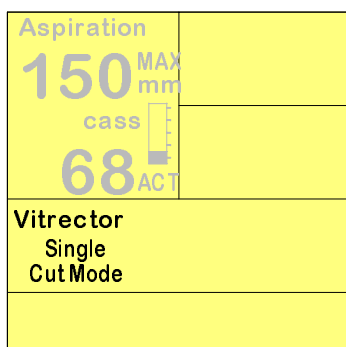
rate to 5 CPM. Then release the DOWN button, depress it again and the single cut message will be displayed in the region normally containing the numerical value of cut rate. To deactivate single cut mode, simply depress the UP control button. Three additional methods may be enabled to initiate a single cut. If single cut on cut enable switch is enabled, actuating the cut enable switch with the foot pedal up will cause a single cut. If single cut on the reflux switch is enabled, actuating the reflux switch with the foot pedal depressed will cause a single cut. If enabling single cut mode using the ON/OFF button is enabled, pressing and holding the vitrector ON/OFF button for one second will toggle between single cut mode and rapid cut mode. The three additional single cut modes can be individually enabled and disabled using the utilities menu (see SINGLE CUT OPTIONS on page 143).



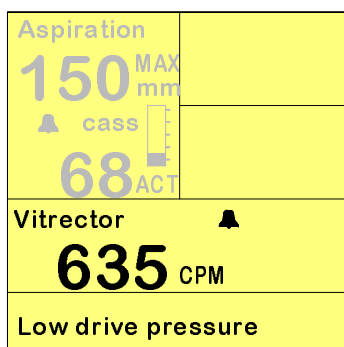
Posterior Vitrectomy
Normal Indication
Vitrector Function
LED is GREEN



Anterior Vitrectomy
Normal Indication
Vitrector Function
LED is GREEN



Vitrectomy Single Cut Mode
Normal Indication
Vitrector Function
LED is GREEN



Vitrectomy Low Drive
Pressure Alarm
Vitrector Function
LED is RED



Figure 30 shows typical displays for posterior and anterior vitrectomy. The display at the top left is for posterior mode. The display at the top right is for anterior mode. The anterior mode display shows the irrigation valve open. The display at the bottom left is an example of single cut mode.

The display at the bottom right of Figure 30 is the low drive pressure alarm. If the vitrectomy control system senses that the console drive pressure is not sufficient to meet the selected cut rate, the warning will be displayed, the vitrector mode LED will change from green to red, indicating an alarm condition, and the vitrector will stop cutting.

Figure 30. Displays: Posterior & Anterior Vitrectomy



WARNING: The vitrector drive system can be adjusted to 2000 CPM but the maximum reliable cut rate depends upon the vitrector being used. See ACCESSORIES DESCRIPTION for VITRECTOMY CUTTER on page 85 for details.

EQUIPMENT SETUP & OPERATION

ILLUMINATION

With the vitrector and ultrasound surgical functions disabled, the illumination surgical function will display the time on both bulbs and indicate which bulb is illuminated. If a bulb is missing or open, the hours area for the bulb will be blank. When the vitrector or ultrasound surgical function is on, an active illumination surgical function will be indicated by an asterisk (*) appearing in the vitrector or ultrasound area of the LCD display (see Figure 16 on page 32 or Figure 17 on page 33).

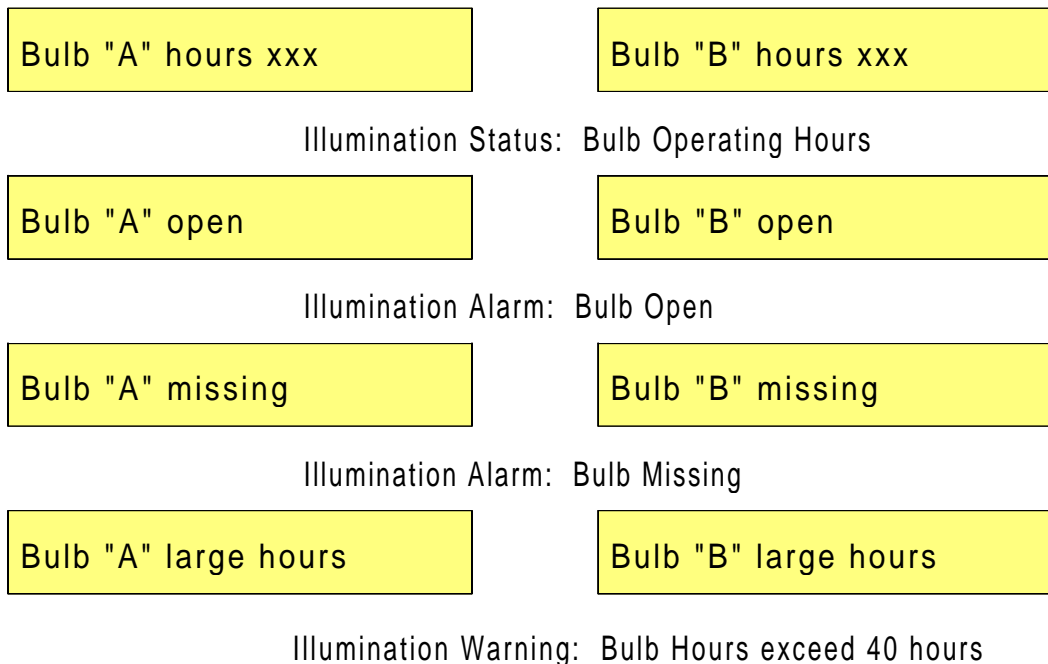


Figure 31. Displays: Illumination

Figure 31 shows the status line messages associated with the illumination surgical function. The bulb operating hours status line message, for the currently selected bulb, is displayed for five seconds when the illumination surgical function is enabled. The bulb operating hours status line messages will also be displayed for five seconds, for any bulb present, when the VitMan is powered up. The bulb open status line message will be displayed whenever a bulb is not detected. The bulb missing status line message will be displayed for five seconds, for each bulb not detected, when the VitMan is powered up. If the time on a bulb exceeds forty hours, the large bulb hours status line message will be displayed when the illumination surgical function is enabled and when the VitMan is powered up.

POSTERIOR ULTRASOUND: Lens Fragmenataion

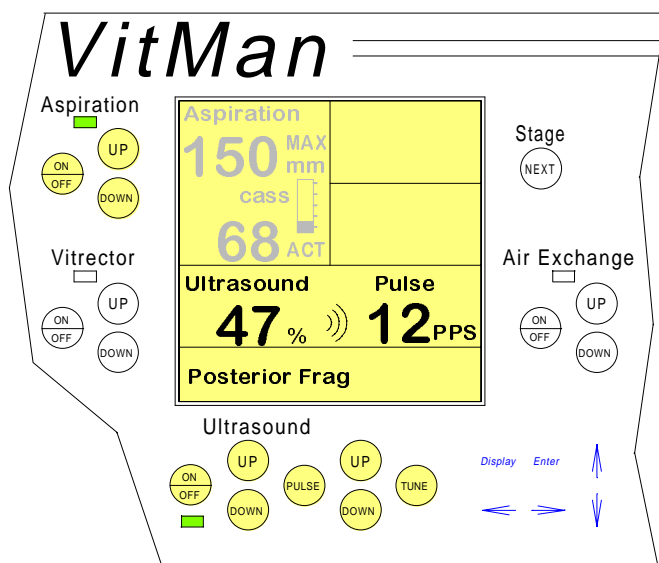


Figure 32. Front Panel Controls & Indications: Ultrasound

Figure 32 shows the display and control buttons for the ultrasound function in the Posterior Frag mode. For illustration purposes, the ON/OFF, UP, DOWN buttons and the rectangular LED indicator are all shown highlighted to indicate that Aspiration is active. The buttons are not illuminated on the front panel. Only the LED will light up on the front panel. The LED will be GREEN when operating conditions are within normal parameters. The LED will be RED when operating conditions are in an alarm state. A corresponding warning or error

message will be displayed whenever the LED is RED.

Four ultrasound modes are available: 1) Posterior Frag, 2) Anterior Linear Phaco, 3) Anterior Fixed Phaco, and 4) Anterior Frag. These four modes are activated sequentially by repeated depressions of the ultrasound function ON/OFF button. The message displayed will read "Posterior Frag" after the ultrasound ON/OFF button is depressed once. When the ultrasound is activated, the aspiration function will be turned on automatically.

The large number to the left, below the word ULTRASOUND is the percentage power selected. Since the foot pedal controls aspiration linearly in Posterior Frag mode, only fixed power available. The power level is variable from 1 to 100%, in 1% increments, by using the UP or DOWN buttons. Whenever the ultrasound power is activated by the foot pedal's side switch, that fixed amount of power will be applied to the ultrasound handpiece.

Whenever the handpiece is energized, the wave icon will move and an audible sound is generated. Whenever the handpiece is not energized, the wave icon will disappear and the sound will stop.

The next set of three buttons, to the immediate right of the ON/OFF and UP or DOWN power control buttons, are the PULSE and another set of UP or DOWN buttons. These controls activate the Pulse mode, indicated by the large number on the right side of the display below the word PULSE. PPS signifies Pulses Per

EQUIPMENT SETUP & OPERATION

Second. The UP or DOWN buttons select the pulse rate between 1 and 20 pulses per second. Pulse mode applies the amount of power selected at a 50% duty cycle for whatever rate is selected.

The last button control for the ultrasound is labeled “TUNE”. Before operating the ultrasound handpiece, it is necessary to tune the ultrasound drive circuit to the operating characteristics of the handpiece. The ultrasound handpiece must be tuned so that the output power signal of the Syntec VitMan[®] ultrasound drive circuit is properly conditioned to match the resonant characteristics of the ultrasound transducer housed in the handpiece. However, some versions of the Syntec VitMan incorporate ultrasound electronics capable of automatically tuning the ultrasound handpiece. These versions do not have a TUNE button present on the front panel. If your system does not have a TUNE button, ignore all references to manual tuning.



WARNING: The ultrasound handpiece must be assembled with a frag needle, and the needle must be immersed in sterile fluid for the tuning process to be effective.

After making the proper connections to the handpiece, i.e., electrical power and aspiration on the console front panel, attach a frag needle to the handpiece. Then immerse the frag needle in sterile fluid, and prime the handpiece. If the auto tune option is selected, then the handpiece will be tuned at the end of the aspiration timed prime cycle. See ASPIRATION PRIMING on page 37. If using continuous prime mode, after aspiration priming is complete, press the TUNE button, to initiate the handpiece tuning cycle.

When a tuning cycle is started, the display message will say “Tuning handpiece”. You will hear two or three short bursts and two or three long bursts of power being applied to the handpiece. After about 15 seconds, when the tuning cycle is complete, the “Tuning handpiece” message will disappear, the mode LED will turn green, and the handpiece is ready to use. If for some reason the tuning procedure was not successful, the warning message “Tuning unsuccessful” will appear on the screen, and the function LED will remain red. “Tuning aborted” will appear if the tuning cycle is terminated by foot pedal activity.

The system will sense if the handpiece is present. If Ultrasound is selected without having a handpiece connected, the warning message “No handpiece present” will appear, and the mode LED will be red.

If the handpiece has not been tuned, or if it has been disconnected from the front panel and then reconnected without retuning, the message “Please tune handpiece” will appear, if the ultrasound function is enabled. The function LED will be red.

EQUIPMENT SETUP & OPERATION

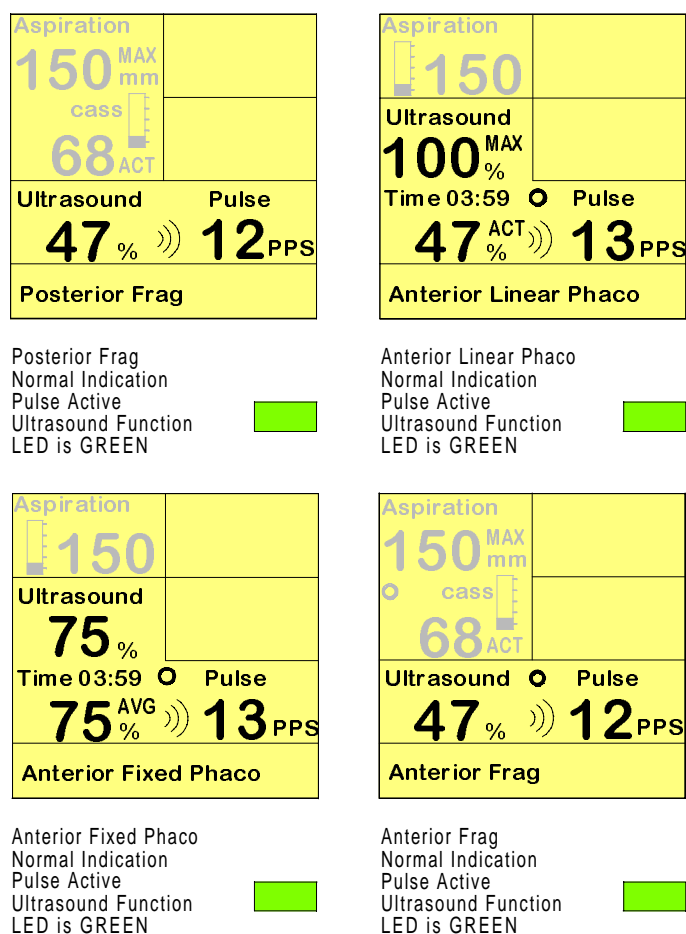


Figure 33. Displays: Ultrasound Modes: Normal Indications

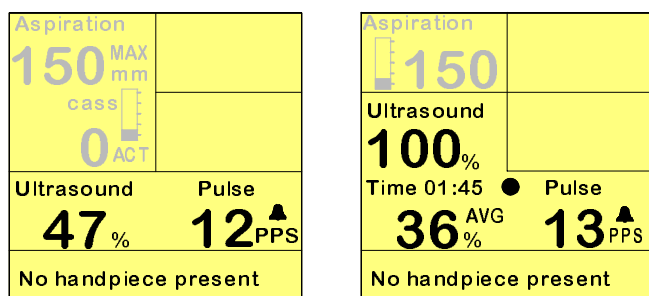
Ultrasound normal indication displays are shown in Figure 33. Notice that the numerical values for actual ultrasound match the console setting in anterior fixed phaco. In linear phaco, the console setting is followed by the label MAX to indicate the maximum power level commanded when the foot pedal is fully depressed. For the anterior modes, the irrigation valve icon will be displayed. The irrigation valve icon is to the right of the ultrasound usage time for the phaco modes and is centered at the top of the ultrasound display area for anterior frag. If the irrigation valve is closed, a filled circle will be displayed. If the irrigation valve is open, an empty circle will be displayed. The maximum power level is selectable from the front panel by using the UP and DOWN buttons.

Percent power is a relative indication of the actual energy delivered to the point of application of the ultrasound handpiece needle.

The display of percent power in Linear Phaco mode will change from ACT to AVG when there is no foot pedal activity commanding the ultrasound handpiece to be energized. ACT indicates the actual or instantaneous power being applied when the foot pedal is active. AVG indicates the Average power applied over the total time period that ultrasound was active.

The left display in Figure 34 shows the handpiece disconnected alarm as it appears in Posterior Frag mode where control of the ultrasound power level is fixed and control of aspiration is linear. The right display in Figure 34 shows the alarm as it appears in Anterior Phaco modes where control of the ultrasound power level is linear and control of aspiration is fixed. In fixed aspiration mode the vacuum level will be at the selected value after the aspiration rise time has expired. The aspiration rise time specifies the length of time for the vacuum level to reach the desired level. The vacuum level will rise linearly over the duration

EQUIPMENT SETUP & OPERATION



Handpiece Disconnected
Alarm
Ultrasound Function
LED is RED

Ultrasound DISABLED

Handpiece Disconnected
Alarm
Ultrasound Function
LED is RED

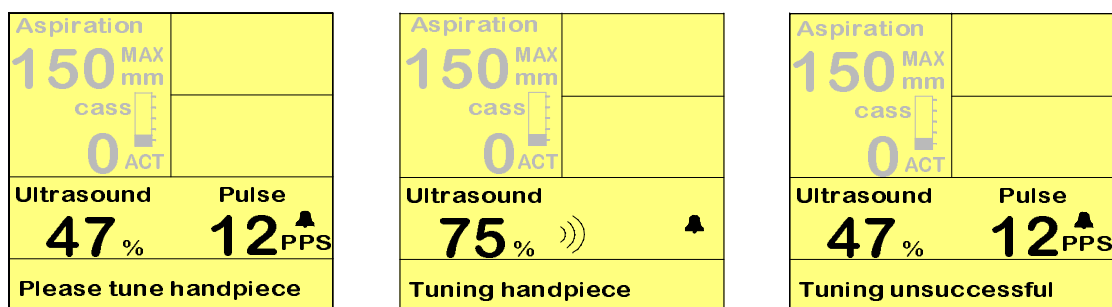
Ultrasound DISABLED

Figure 34. Displays: Ultrasound: Handpiece Disconnected

specified. The aspiration rise time can be adjusted using the utilities menu (see ASPIRATION RISE TIME on page 127).

Figure 35 shows the ultrasound tuning warning and error messages as they will appear in Posterior Frag mode. When the ultrasound function is enabled and a handpiece is connected the ultrasound function LED will be RED, and the warning

message “Please tune handpiece” will be displayed at the bottom of the LCD display, until the handpiece is tuned. Each time a handpiece is connected, it must be tuned prior to use. Turning off the ultrasound function, or changing modes, will not require the handpiece to be re-tuned. Note that some versions of the Syntec VitMan incorporate ultrasound electronics capable of automatically tuning the ultrasound handpiece and therefore do not have a TUNE button present on the front panel. If your system does not have a TUNE button, the “Please tune handpiece” message will not be displayed and the ultrasound function LED will be GREEN after the handpiece is connected.



Handpiece Requires
Tuning Warning
Ultrasound Function
LED is RED

Ultrasound DISABLED

Handpiece Tuning in
Progress Warning
Ultrasound Function
LED is RED

Handpiece Tuning
Unsuccessful Alarm
Ultrasound Function
LED is RED

Ultrasound DISABLED

Figure 35. Displays: Ultrasound Tuning: Posterior Frag Mode

Tuning is initiated by either depressing the Tune button or by priming the handpiece with the auto tune option selected in the utilities menu (see AUTO TUNE IS ENABLED/AUTO TUNE DISABLED on page 169). While tuning, the ultrasound handpiece will be energized at 75% power, with the message “Tuning Handpiece” displayed, and the ultrasound function LED lighted RED.

EQUIPMENT SETUP & OPERATION

When tuning is successfully completed, the display will change to one of the normal indications as shown in Figure 33. In the event that the tuning cycle was not successful, the message “Tuning unsuccessful” will appear and the ultrasound function LED will remain RED.

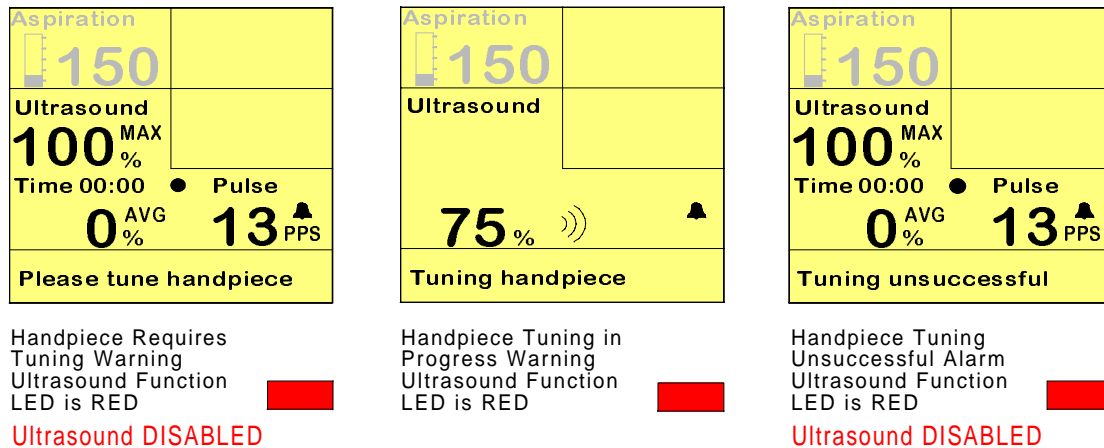
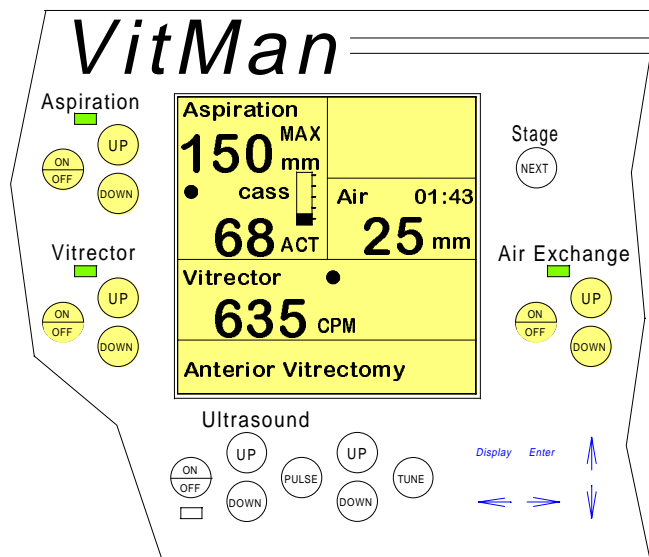


Figure 36. Displays: Ultrasound Tuning: Phaco Modes

Figure 36 shows the appearance of the ultrasound tuning warning and error messages as they will appear for Anterior Phaco modes. Notice that at the end of the tuning cycle, the value for AVG (average) phaco power remains unchanged.

EQUIPMENT SETUP & OPERATION

ANTERIOR DISPLAY: Vitrector Active with other Surgical Functions



**Figure 37. Anterior Controls & Indications:
Vitrector Active**

In Figure 37, Vitrector is active with two other surgical functions, Aspiration and Air Exchange. Ultrasound is not active. Vitrector and Ultrasound are mutually exclusive drive functions, that is only one of the two may be active at any given time.

For illustration purposes, the ON/OFF, UP, DOWN buttons and the rectangular LED indicator are all shown highlighted to indicate which functions are active. Only the LED will light up on the front panel. The buttons are not illuminated on the front panel.

The LED will be GREEN when operating conditions are within normal parameters. The LED will be RED when operating conditions are in an alarm state. A corresponding warning or error message will be displayed whenever the LED is RED.

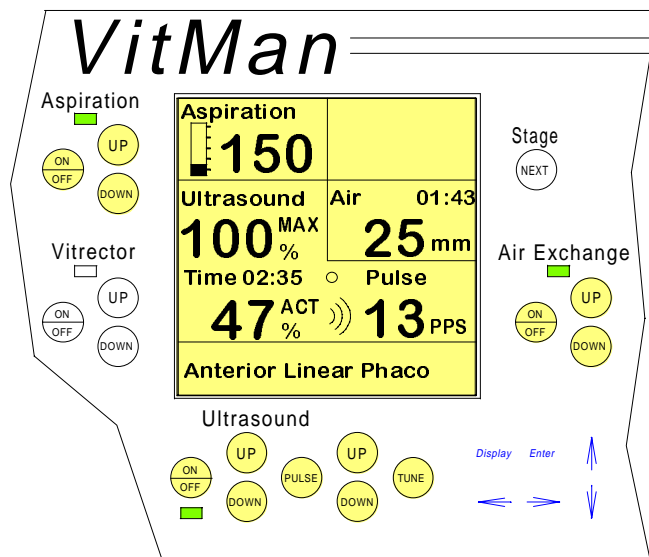
The Air Exchange function is independent from all others. Although Air Exchange is shown active in Figure 37, its function is primarily one used in posterior surgery. However, it is possible to use the positive pressure output to pressurize the irrigation bottle by using an appropriate tubing set and electronically simulate changing the bottle height.

Notice that the appearance of this display is similar to that of Posterior Vitrectomy. The only difference will be in the message displayed when anterior vitrectomy mode is entered and the irrigation valve icon. The irrigation valve icon is centered at the top of the vitrector display area. If the irrigation valve is closed, a filled circle will be displayed. If the irrigation valve is open, an empty circle will be displayed. The vitrector modes and warning messages have been displayed earlier. Refer to VITRECTOMY: Posterior & Anterior on page 44.

The operation of the vitrector surgical function may be customized to match the style of vitrector being used. If a vitrector style is chosen, the reorder number will display in the upper right corner of the vitrector area of the LCD display. The vitrector style can be selected using the utilities menu (see PICK VITRECTOR STYLE, BY REORDER NUMBER on page 146).

EQUIPMENT SETUP & OPERATION

ANTERIOR DISPLAY: Ultrasound Active with other Surgical Functions



**Figure 38. Anterior Controls & Indications:
Ultrasound Active**

In Figure 38, Ultrasound is active with two other surgical functions, Aspiration and Air Exchange. Vitrector is not active. Ultrasound and Vitrector are mutually exclusive drive functions, that is only one of the two may be active at any given time.

The Air Exchange function is independent from all others. Although Air Exchange is shown active in Figure 38, its function is primarily one used in posterior surgery. However, it is possible to use the positive pressure output to pressurize the irrigation bottle by using an appropriate tubing set and

electronically simulate changing the bottle height.

For illustration purposes, the ON/OFF, UP, DOWN buttons and the rectangular LED indicator are all shown highlighted to indicate which functions are active. The buttons are not illuminated on the front panel. Only the LED will light up on the front panel. The LED will be GREEN when operating conditions are within normal parameters. The LED will be RED when operating conditions are in an alarm state. A corresponding warning or error message will be displayed whenever the LED is RED.

Notice also that the PULSE button on the Ultrasound is also highlighted. With PULSE selected, the display also shows the pulse rate for the ultrasound handpiece driver.

Four ultrasound modes are available: 1) Posterior Frag, 2) Anterior Linear Phaco, 3) Anterior Fixed Phaco, and 4) Anterior Frag. These four modes are activated sequentially by repeated depressions of the ultrasound function ON/OFF button. The message “Anterior Linear Phaco” displayed in Figure 38 will appear with the second depression of the ultrasound function ON/OFF button.

ANTERIOR ASPIRATION: Supporting Ultrasound Phacoemulsification

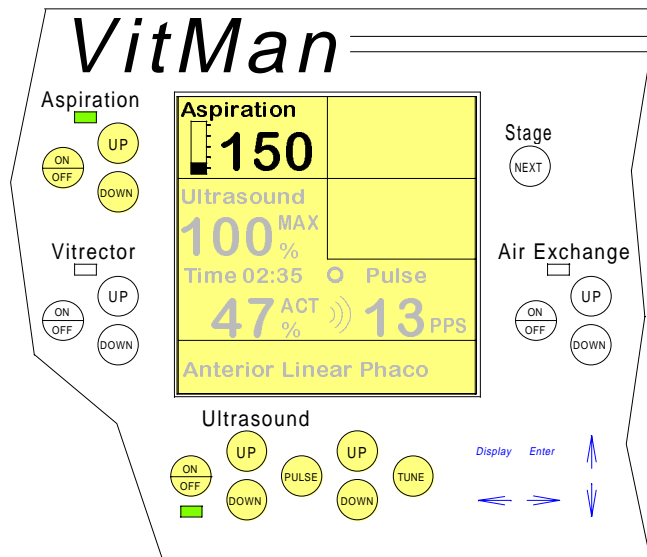


Figure 39. Anterior Controls & Indications: Aspiration

Figure 39 shows the display for anterior aspiration as it will automatically appear when the Anterior Linear Phaco or Anterior Fixed Phaco ultrasound modes are selected. Vacuum is controlled at the fixed level selected with the aspiration function UP and DOWN buttons.

The numerical value of fixed aspiration (vacuum) is selectable over the full range from 0 to 500 mmHg. Although typically the fixed aspiration value used in phacoemulsification rarely exceeds 100 mmHg for the ultrasound handpiece, the full range is allowed.



WARNING: Aspiration flow should never exceed Irrigation flow. This can cause collapse of the eye. Always test with a test chamber, available from Syntec, prior to use in the eye.

Fixed Aspiration mode is not directly selectable from the aspiration function ON/OFF button. Fixed Aspiration is automatically activated with Anterior Linear Phaco and Anterior Fixed Phaco ultrasound modes, and Posterior Linear Rate and Anterior Linear Rate vitrector modes. Selecting an aspiration mode by depressing the aspiration function ON/OFF button results in either Posterior or Anterior Aspiration, both of which are linear vacuum control modes.

The ultrasound function is also dependent on the aspiration function to the degree that the ultrasound handpiece cannot be energized without active aspiration.

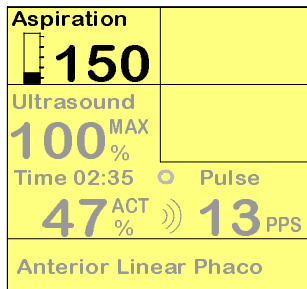
The vitrector function does not depend on the aspiration function. The vitrector may be energized without active aspiration.

The only difference between Posterior and Anterior aspiration modes is that a percentage of foot pedal angular motion is reserved to activate the irrigation

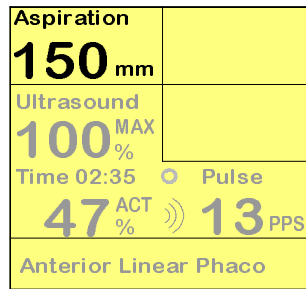
EQUIPMENT SETUP & OPERATION

pinch valve. This is true regardless of whether the control of vacuum is linear or fixed.

Normally in posterior surgical procedures, the irrigation (or infusion) fluid is delivered to the eye via a separate cannula. In anterior procedures, the normal mode for infusion fluid delivery is through an additional port integral to the surgical instrument being used. This is true for the I/A handpiece, the vitrector, and the ultrasound handpiece.



Cassette Icon Enabled
Normal Indication
Aspiration Function
LED is GREEN

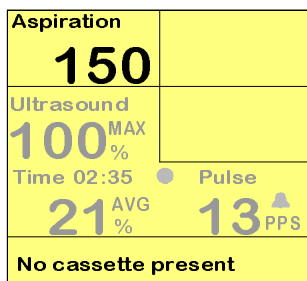


Cassette Icon Disabled
Normal Indication
Aspiration Function
LED is GREEN



The displays in Figure 40 show the normal anterior fixed aspiration displays, with and without the cassette icon. When the cassette icon is present, it indicates the relative fluid level in the cassette. The cassette icon can be enabled or disabled by using the utilities menu (see CASSETTE ICON IS ON/CASSETTE ICON IS OFF on page 177).

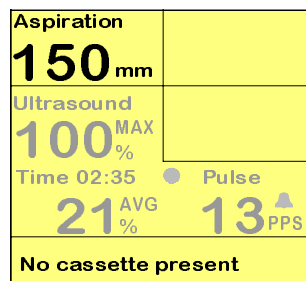
**Figure 40. Displays: Anterior (Fixed)
Aspiration: Normal Indications**



Cassette Icon Enabled
Cassette Alarm
Aspiration Function
LED is RED



Aspiration & Ultrasound
DISABLED



Cassette Icon Disabled
Cassette Alarm
Aspiration Function
LED is RED



Aspiration & Ultrasound
DISABLED

If for some reason the cassette is not seated properly, the cassette icon will disappear and an error message will be displayed indicating that the cassette is not present. In that situation, the aspiration mode LED will change from green to red, indicating an alarm, and aspiration will not function.

**Figure 41. Displays: Anterior (Fixed)
Aspiration: Cassette Alarm**

The displays in Figure 41 show the cassette alarm displays as they appear with and without the cassette icon. Notice that both aspiration and ultrasound are immediately disabled when the cassette alarm condition exists.

Figure 42 shows the display as it will appear while the aspiration system is priming. Since the available display area in fixed anterior aspiration is much smaller than in linear aspiration, the message "Prime in progress" will appear the same whether or not the cassette icon is displayed.

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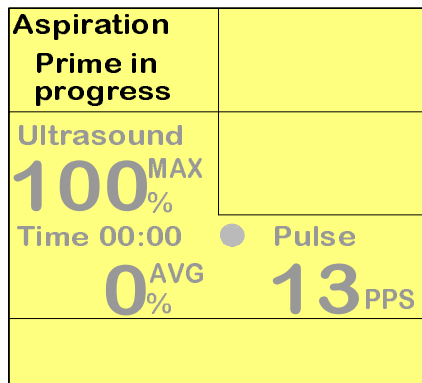


Figure 42. Displays: Anterior (Fixed) Aspiration: Priming

Notice also, that the other warning messages appear identically as with linear aspiration. See Figure 43 and Figure 44. Only the functional display area appears differently because of the smaller size. See ASPIRATION PRIMING on page 37.

Note also that the aspiration values displayed in Figure 43 and Figure 44 are the set point, not the actual vacuum level. This is because the aspiration setting represents a fixed vacuum level command. There is no linear foot pedal control of aspiration in this case, therefore, when aspiration begins, the vacuum level will be at the

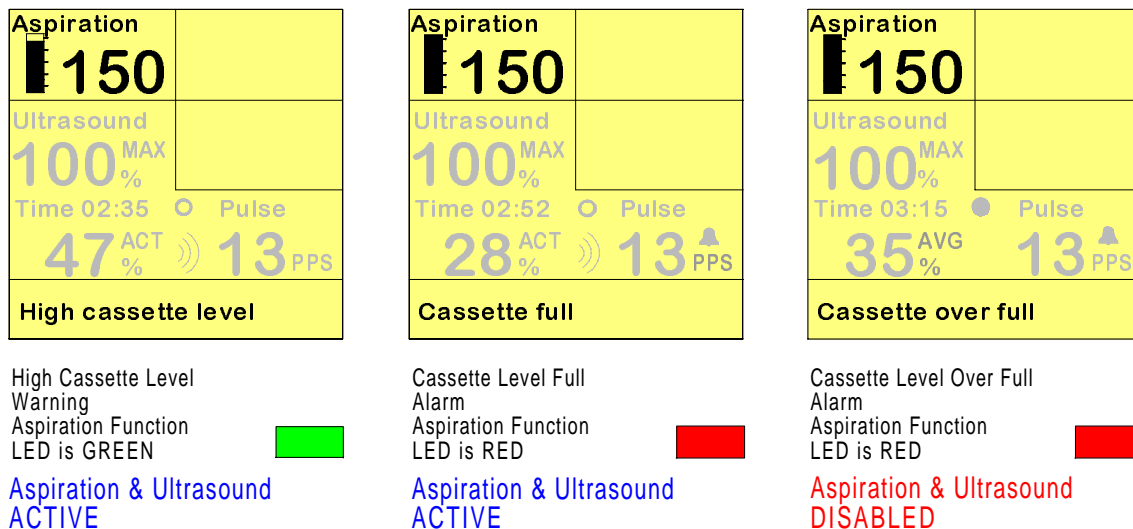
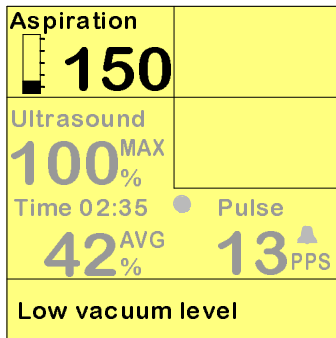


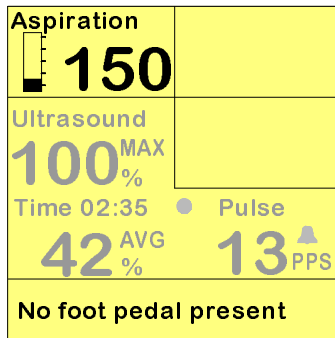
Figure 43. Displays: Anterior (Fixed) Aspiration: Cassette Fluid Level Indications

selected value after the aspiration rise time has expired. The aspiration rise time specifies the length of time for the vacuum level to reach the desired level. The vacuum level will rise linearly over the duration specified. The aspiration rise time can be adjusted using the utilities menu (see ASPIRATION RISE TIME on page 127).

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Vacuum Level
Warning
Aspiration Function
LED is RED



Foot Pedal
Alarm
Aspiration Function
LED is RED



Aspiration & Ultrasound
DISABLED

**Figure 44. Displays: Anterior (Fixed) Aspiration:
Vacuum Level & Foot Pedal Alarms**

EQUIPMENT SETUP & OPERATION

ANTERIOR ULTRASOUND: Phacoemulsification

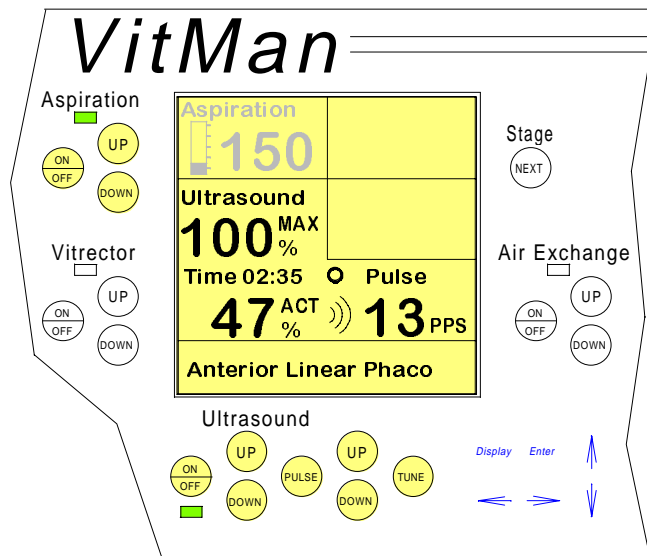


Figure 45. Anterior Controls & Indications: Ultrasound

Figure 45 shows the display, as it will appear for anterior ultrasound phacoemulsification with fixed aspiration mode. Anterior Linear Phaco and Anterior Fixed Phaco are the two ultrasound modes requiring fixed aspiration (vacuum).

Four ultrasound modes are available:

- 1) Posterior Frag
- 2) Anterior Linear Phaco
- 3) Anterior Fixed Phaco
- 4) Anterior Frag

These four modes are activated sequentially by repeated depressions of the ultrasound

function ON/OFF button. Anterior Frag is similar in function to Posterior Frag with the exception that the irrigation pinch valve is used to control irrigation fluid to the anterior ultrasound phaco handpiece.

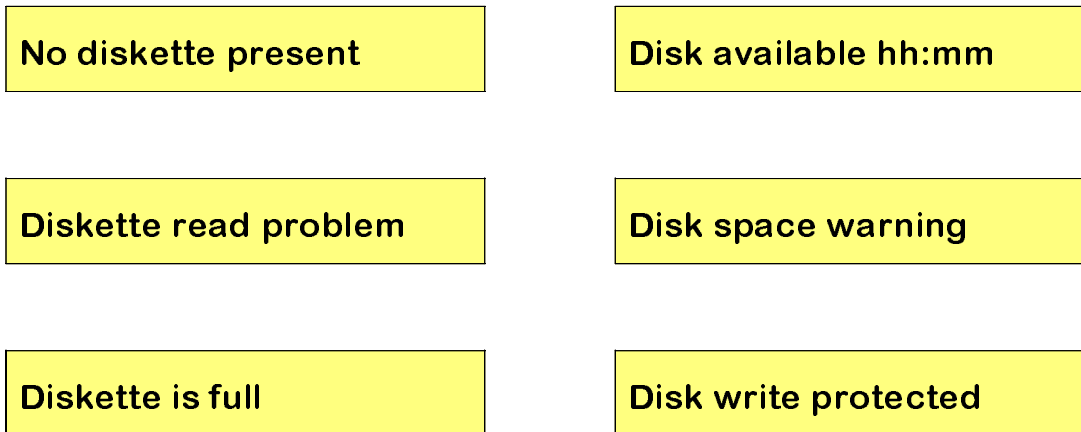
The display arrangement is different in fixed aspiration, anterior ultrasound modes in that both the maximum and the actual ultrasound power are displayed.

The time counter is located between the MAX and ACT numerical percentage power display values. The time counter will display the total elapsed time that the handpiece has been energized. When the handpiece is not energized, the actual power display will change to show the average ultrasound power applied during the total elapsed time. The alpha indicator behind the actual power number will change from ACT (indicating actual power while energized) to AVG (indicating the average power).

The different mode selections and warning messages have been described earlier. Refer to POSTERIOR DISPLAY: Ultrasound Active with other Surgical Functions on page 33.

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FLOPPY DISK DRIVE



Diskette Status Messages

Figure 46. Displays: Floppy Disk Drive

Figure 46 shows information messages displayed in the lower section of the Syntec VitMan[®] display. The floppy disk can be used to log system parameters while the console is in use. It can also be used to install system software and assist technicians with system diagnostics. More details on use of the disk drive are given in the DISK SERVICES command descriptions beginning on page 182.

To log the system parameters of the Syntec VitMan[®], insert a p.c. format, high density, 3½" floppy disk, into the disk drive. The file VITMAN.LOG is created and data is stored in the file. If the "Diskette read problem" status message appears, the format of the diskette may be incorrect. To correct the format use the FORMAT DISK command found in the DISK SERVICES menu (page 186).

Once a minute an attempt is made to log the system parameters on the diskette. If the diskette is missing, the message "No diskette present" will be displayed. If a diskette is present, and space is available, the system parameters for the previous minute will be saved. After the data is saved, the message "Disk available hh:mm" will indicate the minimum recording time remaining on the diskette. The "Disk space warning" message will appear when data is written to the diskette and the time remaining is less than 30 minutes. The "Diskette is full" message indicates that no space for data recording is available on the diskette. If the write protect tab on the diskette is in the lock position then the "Disk write protected" message will be displayed.

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CONSOLE TEMPERATURE

High temperature 50°C

Low temperature +10°C

Internal Console: Temperature Warnings

Over temperature

Shutdown at 55°C

Device disabled

Temp sensor problem

Internal Console: Temperature Alarms

Figure 47. Displays: Internal Console Temperature Warning

Internal temperature is monitored and an information warning will be issued if the internal console temperature lies outside an acceptable range. If the current device temperature exceeds the upper limit of 49 °C, the message “High temperature xx°C” will display in the status line, where xx is the current device temperature and a warning tone will be generated (see Figure 47). If the current device temperature is below the lower limit of 11 °C, the message “Low temperature ±xx°C” will display in the status line, where ±xx is the current device temperature (see Figure 47). If the current device temperature is 53 °C or greater, the message “Over temperature” will be displayed in the status line, and a warning tone will be generated every five seconds. If the current device temperature is 53 °C or greater, but less than 55 °C, the message “Shutdown at 55°C” will be displayed in the status line. If the current device temperature is 55 °C or greater, the message “Device disabled” will be displayed in the status line along with the “Over temperature” and “High temperature” messages. Ten seconds after this error occurs the illumination bulbs will be turned off and the pressure and vacuum pumps will be shut off. For the first ten seconds, an error tone will be played every ½ second, then an error tone every two seconds thereafter. The error tones will continue until the temperature is reduced to 52 °C. While the temperature is 55 °C or greater, the pressure compressor, vacuum pump and illumination may not be enabled. If the temperature sensor cannot be read, the message “Temp sensor problem” will be displayed in the status line.

The display of the high and low temperature messages can be enabled and disabled using the utilities menu (see TEMP MESSAGES ARE ON/TEMP MESSAGE IS OFF on page 178).

FOOT PEDAL CONTROLS

FOOT PEDAL: Overview

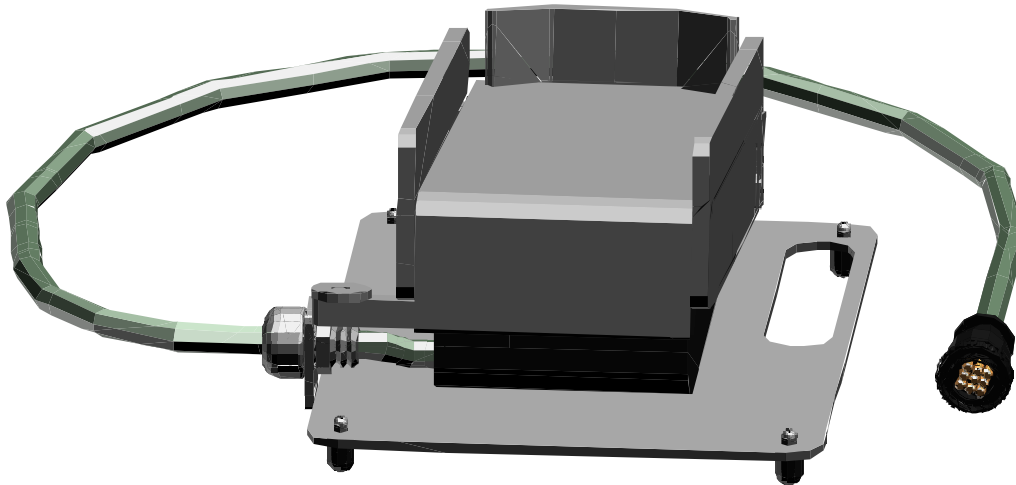


Figure 48. Syntec VitMan[®] Foot Pedal

Figure 48 shows the foot pedal from the front in a perspective view. In the rest position, the foot pedal is rotated approximately 15 degrees vertically from the horizontal foot pedal base. The center of rotation is about 2 inches forward of the heel rest. The foot pedal vertical angular rotation is used to control the levels of the functions of irrigation, aspiration, and ultrasound, depending on the active surgical function modes.

The foot pedal also rotates ± 5 degrees side to side from the center on the foot pedal base. This side to side motion engages electrical switches that control the functions of reflux, and vitrector or ultrasound depending on the console control configuration.

The side panels on the foot pedal are adjustable to allow a snug, comfortable fit. The side panels are released by depressing the lever on the right side of the foot pedal. The left side of the foot pedal base has an oblong rounded cutout to use as a handle.

FOOT PEDAL: Legend

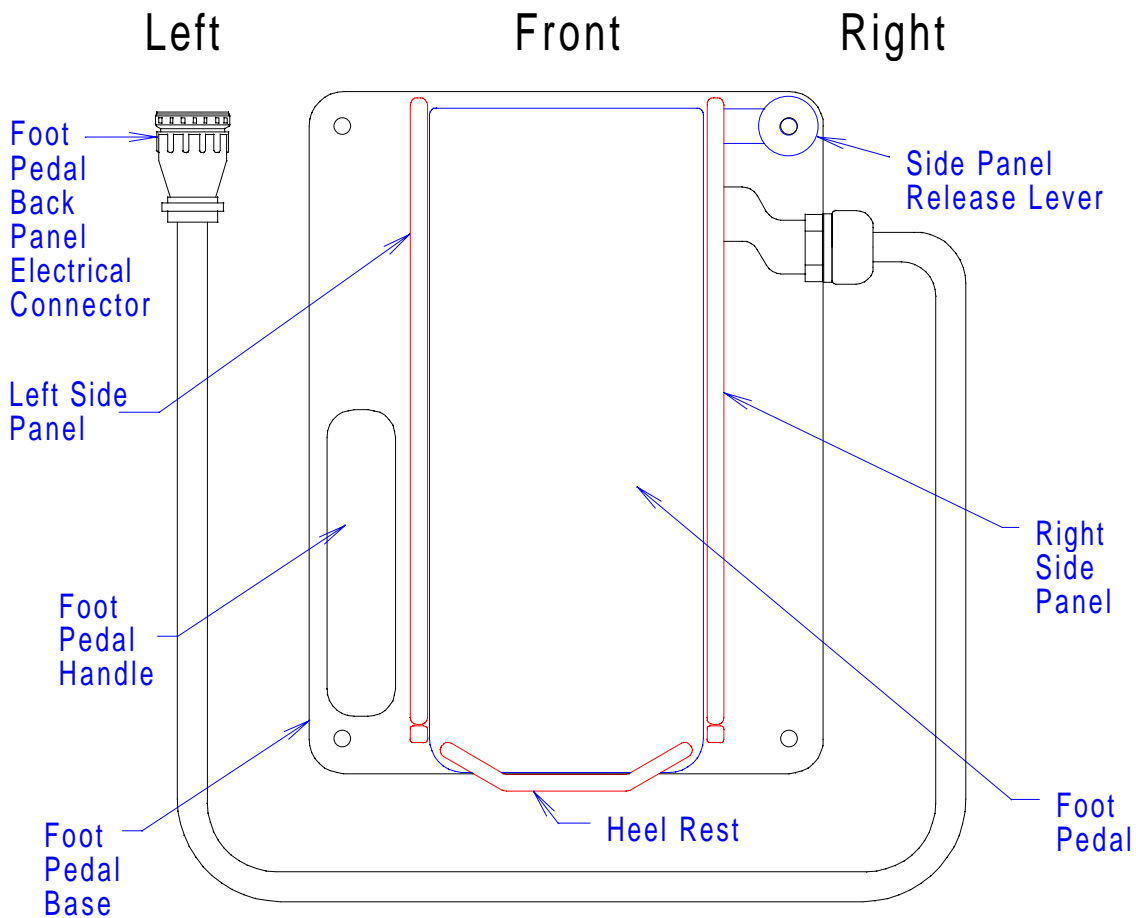


Figure 49. Foot Pedal: Top Schematic View

A schematic view of the foot pedal is shown in Figure 49, with the main parts identified. The foot pedal side panels are shown in the fully retracted position.

The foot pedal is shown in the horizontal rest position, with neither side switch activated. The side switches are not visible in this view. They are mounted inside the foot pedal, with their activation mechanisms mounted to the foot pedal base just below the foot pedal.

The foot pedal electrical cord connects to the Syntec VitMan[®] console back panel. The connector is keyed to ensure proper electrical connections between the connector pins.

FOOT PEDAL: Side Panel Adjustment

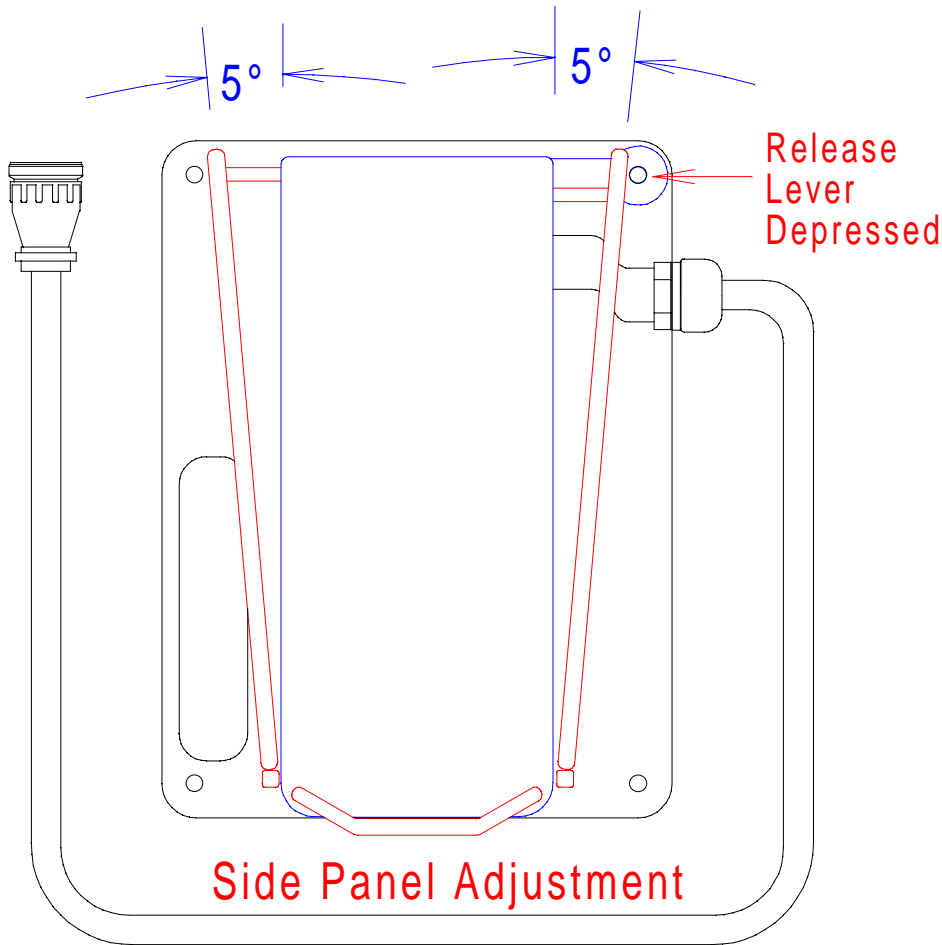


Figure 50. Foot Pedal: Side Panel Adjustment

Figure 50 shows the foot pedal side panels adjusted 5 degrees outward from center by depressing the release lever. The intention of the design is for the user to depress the release lever and slide his or her foot, heel first, along the foot pedal from front to back, until the heel rests comfortably against the heel rest.

With the release lever depressed, the side panels will slide open to a maximum of 5 degrees either side from center, while maintaining slight pressure on the sides of the foot as it slides into position. In this manner, the user's foot will be gently held in place, linking the user's foot and the foot pedal into a single effective mechanism to control the vertical and horizontal rotation of the foot pedal. When the lever is released, the side panels maintain their position. This allows the foot to be removed without requiring a readjustment. The side panels can be left in the adjusted position until a user with a different size foot requires readjustment.

FOOT PEDAL: Right Side Switch: Vitrector & Ultrasound

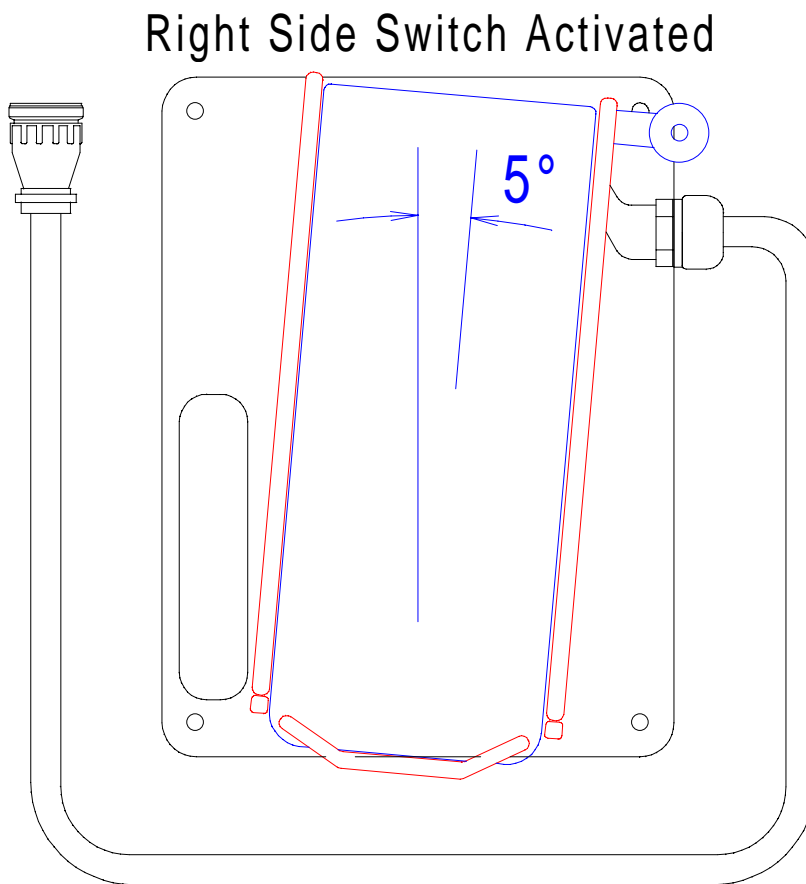


Figure 51. Foot Pedal: Right Side Switch Activated

Figure 51 shows the horizontal rotation position of the foot pedal, relative to the foot pedal base, required to activate the right side switch. When reflux is specified to be on the left side switch, the right side switch is used to enable the vitrector or the ultrasound. The functions of the left and right side switches may be reversed using the utilities menu (see REFLUX IS ON LEFT/REFLUX IS ON RIGHT on page 127). The default is to have the vitrector and ultrasound cut enable on the right side switch. Two modes for the cut enable

switch are available. While in momentary mode, the foot pedal must be held to the side for cutting to be enabled. While in toggle mode, the cut enables state changes from on to off or from off to on, when the cut enable switch is activated. The toggle/momentary mode selection is made in the utilities menu (see the CUT SWITCH MODE menu on page 141 for the vitrector and scissors or CUT SWITCH MOMENTARY/CUT SWITCH IS TOGGLE on page 155 for the ultrasound). The default is toggle mode for the vitrector and momentary mode for scissors and the ultrasound. When the vitrector surgical function is enabled, the cutter icon will be present, if enabled. The vitrector cutter icon may be disabled using the utilities menu (see CUTTER ICON IS ON/CUTTER ICON IS OFF on page 178). The default for the cutter icon is enabled. When the ultrasound surgical function is enabled, the right side switch only has effect in posterior modes, in anterior modes the right side switch has no effect. Note that the right side switch is only an enable, the foot pedal must also be depressed to begin cutting.

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The right switch can also be used to initiate a single cut of the vitrector. Depending upon the mode of the right switch, a single cut can be generated when the foot pedal is either in the rest position or while depressed. If the right switch is selected for the vitrector cut enable and the single cut on the cut enable switch is enabled, then a single cut will occur when the foot pedal is fully up and rotated to the right. If the right switch is selected for reflux and the single cut on reflux switch is enabled, then a single cut of the vitrector will occur when the foot pedal is depressed and rotated to the right. The default has single cut on the right switch disabled. To enable or disable single cutting on the side switches, see the SINGLE CUT OPTIONS menu on page 143.

FOOT PEDAL: Left Side Switch: Reflux

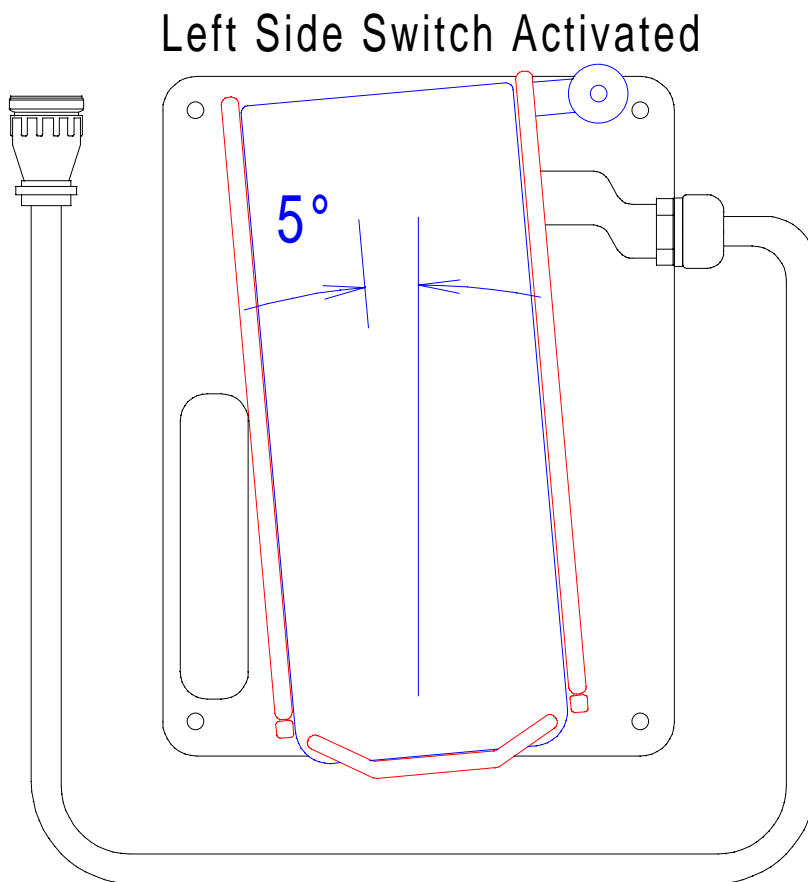


Figure 52. Foot Pedal: Left Side Switch Activated

Figure 52 shows the horizontal rotation position of the foot pedal, relative to the foot pedal base, required to activate the left side switch. When reflux is specified to be on the left side switch, the right side switch is used to enable the vitrector or the ultrasound. The functions of the left and right side switches may be reversed using the utilities menu (see REFLUX IS ON LEFT/REFLUX IS ON RIGHT on page 127). The default is to have reflux on the left side switch. Two modes for the reflux control switch are available. While in continuous

mode, the reflux valve will remain closed as long as the reflux switch is active. In timed mode, a reflux cycle is started each time the reflux switch is activated. The duration of the reflux hold time may be adjusted using the utilities menu (see REFLUX HOLD TIME on page 129). The default reflux hold time is 250 milliseconds. The reflux switch mode is selected using the utilities menu (see CONTINUOUS REFLUX/TIMED REFLUX MODE on page 128). The default is continuous reflux mode. Note that the foot pedal must be in the vertical rest position for reflux to begin and that depressing the foot pedal will terminate the reflux action.

The left switch can also be used to initiate a single cut of the vitrector. Depending upon the mode of the left switch, a single cut can be generated when the foot pedal is either in the rest position or while depressed. If the left switch is selected for reflux and the single cut on reflux switch is enabled, then a single cut of the vitrector will occur when the foot pedal is depressed and moved to the left. If the left switch is selected for the vitrector cut enable and the single cut on the

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cut enable switch is enabled, then a single cut will occur when the foot pedal is fully up and moved to the left. The default has single cut on the left switch disabled. To enable or disable single cutting on the side switches, see the SINGLE CUT OPTIONS menu on page 143.

FOOT PEDAL: Pedal Angular Rotation Control

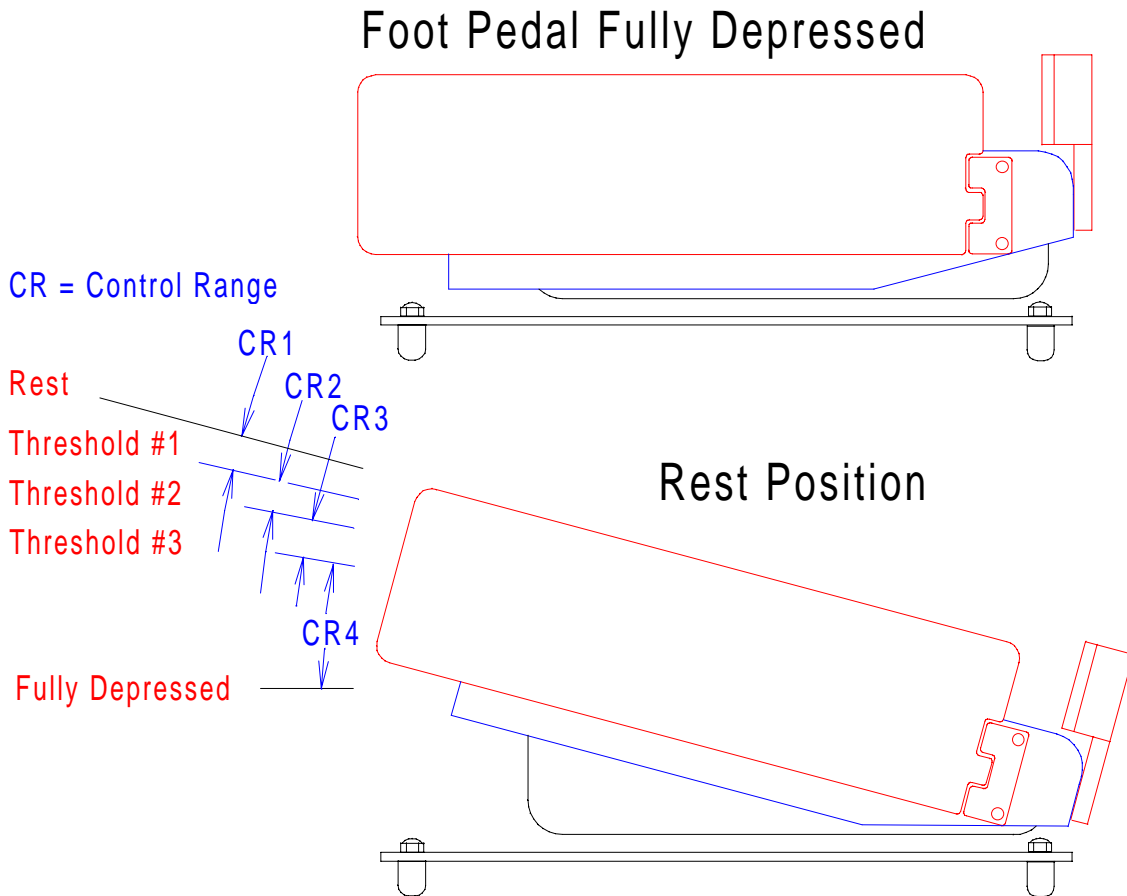


Figure 53. Foot Pedal: Pedal Angular Rotation Control

The vertical rotation range of the foot pedal is shown in Figure 53. Notice that four distinct regions of vertical angular motion are identified as control ranges, separated by thresholds. Depending on the surgical functions selected on the console front panel, all four control ranges may have some impact on the various functions.

The first control range specifies the percentage of foot pedal movement required before the start of irrigation (in anterior modes) or the start of aspiration (in posterior modes). The second control range specifies the percentage movement between opening the irrigation valve and the start of aspiration. This control range is only effective in anterior modes, and is zero for posterior modes. Typically, the percentage for control ranges #1 and #2 are in the 5% to 15% range. Desired settings may vary, and the user has the ability to change these values by using the utilities menu (see the PEDAL THRESHOLDS menu on page

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160). The default value for the first control range is 10%. The default value for the second control range is 10%. The third control range specifies the percentage movement between the start of aspiration and the start of cutting. The default value for the third control range is 10% for ultrasound phaco modes, and 0% for all other modes. The fourth control range is used to provide linear control for surgical function modes. In linear aspiration modes the aspiration level will vary from zero, at the start of the third control range, to maximum when the foot pedal is in the fully depressed position. In fixed aspiration modes the aspiration level is applied at the start of the third control range (threshold #2).

FOOT CONTROL: Reflux

The reflux function can be activated by first releasing the downward rotation on the foot pedal so that it returns to its rest position. Then rotate the foot pedal horizontally to activate the reflux side switch. The switch used for reflux can either be the left or right side switch. The switch to use for reflux can be selected using the utilities menu (see REFLUX IS ON LEFT/REFLUX IS ON RIGHT on page 127). The left side switch is the default reflux switch.

Two modes for the reflux control switch are available. While in continuous mode, the reflux valve will remain closed as long as the reflux switch is active. In timed mode, a reflux cycle is started each time the reflux switch is activated. The duration of the reflux hold time may be adjusted using the utilities menu (see REFLUX HOLD TIME on page 129). The default reflux hold time is 250 milliseconds. The reflux switch mode is selected using the utilities menu (see CONTINUOUS REFLUX/TIMED REFLUX MODE on page 128). The default is continuous reflux mode. Note that depressing the foot pedal will terminate the reflux action.

FOOT CONTROL: Posterior Aspiration

In posterior aspiration mode, the aspiration vacuum level will change linearly with foot pedal position. As the foot pedal is pressed from the rest position, no action will occur until threshold #1 is reached. When threshold #1 is reached, the aspiration pinch valve will open and vacuum will be applied to the collection cassette. The remaining angular motion of the foot pedal is available to control aspiration. The vacuum level will be a linear percentage of the maximum aspiration level. The maximum aspiration level is selected on the console front panel, using the aspiration up and down buttons. The resolution of the vacuum command will depend upon the maximum aspiration level selected. For smaller values of maximum aspiration, the resolution of the foot pedal command will increase relative to the resolution when larger values of maximum aspiration are selected. While in posterior modes, control ranges #2 and #3 have no effect.

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FOOT CONTROL: Posterior Vitrectomy

In posterior vitrectomy mode, the aspiration vacuum level will change linearly with foot pedal position and the vitrector cut rate is fixed. As the foot pedal is pressed from the rest position, no action will occur until threshold #1 is reached. When threshold #1 is reached, the aspiration pinch valve will open and vacuum will be applied to the collection cassette (if the aspiration surgical function is on). In addition, when threshold #1 is reached the vitrector will start cutting (if enabled using the cut enable switch). The vitrector will continue to cut as the foot pedal is pressed to the fully depressed position. The vitrector cut rate is specified on the console front panel, using the vitrector up and down buttons. The switch used for the cut enable can either be the left or right side switch. The cut enable switch is specified by selecting the other switch to be used for reflux (see REFLUX IS ON LEFT/REFLUX IS ON RIGHT on page 127). The right side switch is the default cut enable switch. Two modes for the vitrector's cut enable switch are available. While in momentary mode the foot pedal must be held to the side for the vitrector to be enabled. While in toggle mode, the vitrector enables state changes from on to off or from off to on, when the cut enable switch is activated. The toggle/momentary mode selection is made in the utilities menu (see VITRECTOR MOMENTARY/VITRECTOR IS TOGGLE on page 141). The default for the vitrector is toggle mode. When the vitrector surgical function is enabled, the cutter icon will be present, if enabled. The vitrector cutter icon may be disabled using the utilities menu (see CUTTER ICON IS ON/CUTTER ICON IS OFF on page 178). The default for the cutter icon is enabled. The remaining angular motion of the foot pedal is available to control aspiration. The vacuum level will be a linear percentage of the maximum aspiration level. The maximum aspiration level is selected on the console front panel, using the aspiration up and down buttons. The resolution of the vacuum command will depend upon the maximum aspiration level selected. For smaller values of maximum aspiration, the resolution of the foot pedal command will increase relative to the resolution when larger values of maximum aspiration are selected. The vitrector will cut with or without aspiration. While in posterior modes, control ranges #2 and #3 have no effect.

FOOT CONTROL: Posterior Linear Rate

In posterior linear rate mode, the vitrector cut rate will change linearly with foot pedal position and the aspiration level is fixed. As the foot pedal is pressed from the rest position, no action will occur until threshold #1 is reached. When threshold #1 is reached, the aspiration pinch valve will open and a fixed vacuum will be applied to the collection cassette (if the aspiration surgical function is on). The aspiration level is selected on the console front panel, using the aspiration up and down buttons. In fixed aspiration mode the aspiration vacuum level will reach the specified value after the duration specified by the aspiration rise time parameter (see ASPIRATION RISE TIME on page 127). In addition, when

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threshold #1 is reached the vitrector will start cutting at the maximum cut rate (if enabled using the cut enable switch). The remaining angular motion of the foot pedal is available to control the vitrector cut rate. The vitrector cut rate will change linearly from the maximum cut rate to the minimum cut rate as the foot pedal is depressed. The minimum cut rate is reached when the foot pedal is fully depressed. The maximum vitrector cut rate is specified on the console front panel, using the vitrector up and down buttons. The minimum cut rate is specified in the utilities menu (see MINIMUM CUT RATE on page 136). The switch used for the cut enable can either be the left or right side switch. The cut enable switch is specified by selecting the other switch to be used for reflux (see REFLUX IS ON LEFT/REFLUX IS ON RIGHT on page 127). The right side switch is the default cut enable switch. Two modes for the vitrector's cut enable switch are available. While in momentary mode the foot pedal must be held to the side for the vitrector to be enabled. While in toggle mode, the vitrector enables state changes from on to off or from off to on, when the cut enable switch is activated. The toggle/momentary mode selection is made in the utilities menu (see VITRECTOR MOMENTARY/VITRECTOR IS TOGGLE on page 141). The default for the vitrector is toggle mode. When the vitrector surgical function is enabled, the cutter icon will be present, if enabled. The vitrector cutter icon may be disabled using the utilities menu (see CUTTER ICON IS ON/CUTTER ICON IS OFF on page 178). The default for the cutter icon is enabled. The vitrector will cut with or without aspiration. While in posterior modes, control ranges #2 and #3 have no effect.

FOOT CONTROL: Posterior Scissors

In posterior scissors mode, the aspiration vacuum level will change linearly with foot pedal position and the scissors cut rate is fixed. As the foot pedal is pressed from the rest position, no action will occur until threshold #1 is reached. When threshold #1 is reached, the aspiration pinch valve will open and vacuum will be applied to the collection cassette (if the aspiration surgical function is on). In addition, when threshold #1 is reached the scissors will start cutting (if enabled using the cut enable switch). The scissors will continue to cut as the foot pedal is pressed to the fully depressed position. The scissors cut rate is specified on the console front panel, using the vitrector up and down buttons. The switch used for the cut enable can either be the left or right side switch. The cut enable switch is specified by selecting the other switch to be used for reflux (see REFLUX IS ON LEFT/REFLUX IS ON RIGHT on page 127). The right side switch is the default cut enable switch. Two modes for the scissors enable switch are available. While in momentary mode the foot pedal must be held to the side for the scissors to be enabled. While in toggle mode, the scissors enables state changes from on to off or from off to on, when the cut enable switch is activated. The toggle/momentary mode selection is made in the utilities menu (see SCISSORS MOMENTARY/SCISSORS IS TOGGLE on page 142). The default for the scissors is momentary mode. When the vitrector surgical function is enabled, the

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cutter icon will be present, if enabled. The scissors cutter icon may be disabled using the utilities menu (see CUTTER ICON IS ON/CUTTER ICON IS OFF on page 178). The default for the cutter icon is enabled. The remaining angular motion of the foot pedal is available to control aspiration. The vacuum level will be a linear percentage of the maximum aspiration level. The maximum aspiration level is selected on the console front panel, using the aspiration up and down buttons. The resolution of the vacuum command will depend upon the maximum aspiration level selected. For smaller values of maximum aspiration, the resolution of the foot pedal command will increase relative to the resolution when larger values of maximum aspiration are selected. The scissors will cut with or without aspiration. While in posterior modes, control ranges #2 and #3 have no effect.

FOOT CONTROL: Posterior Frag

In posterior frag mode the aspiration vacuum level will change linearly with foot pedal position and the ultrasound power level is fixed. As the foot pedal is pressed from the rest position, no action will occur until threshold #1 is reached. When threshold #1 is reached, the aspiration pinch valve will open and vacuum will be applied to the collection cassette (the ultrasound requires the aspiration surgical function to be on). In addition, when threshold #1 is reached the ultrasound will start cutting (if enabled using the cut enable switch). The ultrasound will continue to cut as the foot pedal is pressed to the fully depressed position. The ultrasound power level is specified on the console front panel, using the ultrasound power up and down buttons. The switch used for the cut enable can either be the left or right side switch. The cut enable switch is specified by selecting the other switch to be used for reflux (see REFLUX IS ON LEFT/REFLUX IS ON RIGHT on page 127). The right side switch is the default cut enable switch. Two modes for the ultrasound's cut enable switch are available. While in momentary mode the foot pedal must be held to the side for the ultrasound to be enabled. While in toggle mode, the ultrasound enables state changes from on to off or from off to on, when the cut enable switch is activated. The toggle/momentary mode selection is made in the utilities menu (see CUT SWITCH MOMENTARY/CUT SWITCH IS TOGGLE on page 155). The default for the ultrasound is toggle mode. When the ultrasound surgical function is enabled, the cutter icon will be present, if enabled. The ultrasound cutter icon may be disabled using the utilities menu (see CUTTER ICON IS ON/CUTTER ICON IS OFF on page 178). The default for the cutter icon is enabled. The remaining angular motion of the foot pedal is available to control aspiration. The vacuum level will be a linear percentage of the maximum aspiration level. The maximum aspiration level is selected on the console front panel, using the aspiration up and down buttons. The resolution of the vacuum command will depend upon the maximum aspiration level selected. For smaller values of maximum aspiration, the resolution of the foot pedal command will increase

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relative to the resolution when larger values of maximum aspiration are selected. While in posterior modes, control ranges #2 and #3 have no effect.

FOOT CONTROL: Anterior Aspiration

In anterior aspiration mode the aspiration vacuum level will change linearly with foot pedal position, after the irrigation valve is opened. As the foot pedal is pressed from the rest position, no action will occur until threshold #1 is reached. When threshold #1 is reached, the irrigation valve will open. If you continue to press down on the foot pedal, when threshold #2 is reached, the aspiration pinch valve will open and vacuum will be applied to the collection cassette. The vacuum level will be a linear percentage of the maximum aspiration level. The maximum aspiration level is selected on the console front panel, using the aspiration up and down buttons. For anterior modes, the angular motion of the foot pedal available to control aspiration is reduced by the sum of control ranges #1 and #2. The resolution of the vacuum command will depend upon the maximum aspiration level selected. For smaller values of maximum aspiration, the resolution of the foot pedal command will increase relative to the resolution when larger values of maximum aspiration are selected.

FOOT CONTROL: Anterior Linear Phaco

In anterior linear phaco mode the ultrasound power level will change linearly with foot pedal position, and after the irrigation valve is opened the aspiration vacuum will reach a fixed level. As the foot pedal is pressed from the rest position, no action will occur until threshold #1 is reached. When threshold #1 is reached, the irrigation valve will open. If you continue to press down on the foot pedal, when threshold #2 is reached, the aspiration pinch valve will open and vacuum will be applied to the collection cassette (the ultrasound requires the aspiration surgical function to be on). In fixed aspiration mode the aspiration vacuum level will reach the specified value after the duration specified by the aspiration rise time parameter (see ASPIRATION RISE TIME on page 127). The vacuum level will be a linear percentage of the maximum aspiration level. The maximum aspiration level is selected on the console front panel, using the aspiration up and down buttons. If you continue to press down on the foot pedal, when threshold #3 is reached the ultrasound will start cutting. The ultrasound will continue to cut as the foot pedal is pressed to the fully depressed position. The ultrasound power level will be a linear percentage of the maximum power level selected on the console front panel. The resolution of the ultrasound power will depend upon the maximum power level selected. For smaller values of maximum power, the resolution of the foot pedal command will increase relative to the resolution when larger values of maximum power are selected. When energy is being delivered to the ultrasound handpiece the cutter icon will be present, if enabled. The ultrasound cutter icon may be disabled using the utilities

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menu (see CUTTER ICON IS ON/CUTTER ICON IS OFF on page 178). The default for the cutter icon is enabled.

FOOT CONTROL: Anterior Fixed Phaco

In anterior fixed phaco mode, the ultrasound power level will remain fixed, and after the irrigation valve is opened the aspiration vacuum will reach a fixed level. As the foot pedal is pressed from the rest position, no action will occur until threshold #1 is reached. When threshold #1 is reached, the irrigation valve will open. If you continue to press down on the foot pedal, when threshold #2 is reached, the aspiration pinch valve will open and vacuum will be applied to the collection cassette (the ultrasound requires the aspiration surgical function to be on). In fixed aspiration mode the aspiration vacuum level will reach the specified value after the duration specified by the aspiration rise time parameter (see ASPIRATION RISE TIME on page 127). The vacuum level will be the maximum aspiration level selected on the console front panel, using the aspiration up and down buttons. If you continue to press down on the foot pedal, when threshold #3 is reached the ultrasound will start cutting. The ultrasound will continue to cut as the foot pedal is pressed to the fully depressed position. The ultrasound power level is specified on the console front panel, using the ultrasound power up and down buttons. When energy is being delivered to the ultrasound handpiece the cutter icon will be present, if enabled. The ultrasound cutter icon may be disabled using the utilities menu (see CUTTER ICON IS ON/CUTTER ICON IS OFF on page 178). The default for the cutter icon is enabled.

FOOT CONTROL: Anterior Frag

In anterior frag mode the ultrasound power level will remain fixed, and after the irrigation valve is opened the aspiration vacuum level will change linearly with foot pedal position. As the foot pedal is pressed from the rest position, no action will occur until threshold #1 is reached. When threshold #1 is reached, the irrigation valve will open. If you continue to press down on the foot pedal, when threshold #2 is reached, the aspiration pinch valve will open and vacuum will be applied to the collection cassette (the ultrasound requires the aspiration surgical function to be on). In addition, when threshold #2 is reached the ultrasound will start cutting (if enabled using the cut enable switch). The ultrasound will continue to cut as the foot pedal is pressed to the fully depressed position. The ultrasound power level is specified on the console front panel, using the ultrasound power up and down buttons. The switch used for the cut enable can either be the left or right side switch. The cut enable switch is specified by selecting the other switch to be used for reflux (see REFLUX IS ON LEFT/REFLUX IS ON RIGHT on page 127). The right side switch is the default cut enable switch. Two modes for the ultrasound's cut enable switch are available. While in momentary mode the foot pedal must be held to the side for the ultrasound to be enabled. While in toggle

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mode, the ultrasound enables state changes from on to off or from off to on, when the cut enable switch is activated. The toggle/momentary mode selection is made in the utilities menu (see CUT SWITCH MOMENTARY/CUT SWITCH IS TOGGLE on page 155). The default for the ultrasound is toggle mode. When the ultrasound surgical function is enabled, the cutter icon will be present, if enabled. The ultrasound cutter icon may be disabled using the utilities menu (see CUTTER ICON IS ON/CUTTER ICON IS OFF on page 178). The default for the cutter icon is enabled. The vacuum level will be a linear percentage of the maximum aspiration level. The maximum aspiration level is selected on the console front panel, using the aspiration up and down buttons. For anterior frag, the angular motion of the foot pedal available to control aspiration is reduced by the sum of control ranges #1 and #2. The resolution of the vacuum command will depend upon the maximum aspiration level selected. For smaller values of maximum aspiration, the resolution of the foot pedal command will increase relative to the resolution when larger values of maximum aspiration are selected.

FOOT CONTROL: Anterior Vitrectomy

In anterior vitrectomy mode, the vitrector cut rate will remain fixed, and after the irrigation valve is opened the aspiration vacuum level will change linearly with foot pedal position. As the foot pedal is pressed from the rest position, no action will occur until threshold #1 is reached. When threshold #1 is reached, the irrigation valve will open. If you continue to press down on the foot pedal, when threshold #2 is reached, the aspiration pinch valve will open and vacuum will be applied to the collection cassette (if the aspiration surgical function is on). If you continue to press down on the foot pedal, when threshold #3 is reached the vitrector will start cutting (if enabled using the cut enable switch). The vitrector will continue to cut as the foot pedal is pressed to the fully depressed position. The vitrector cut rate is specified on the console front panel, using the vitrector up and down buttons. The switch used for the cut enable can either be the left or right side switch. The cut enable switch is specified by selecting the other switch to be used for reflux (see REFLUX IS ON LEFT/REFLUX IS ON RIGHT on page 127). The right side switch is the default cut enable switch. Two modes for the vitrector's cut enable switch are available. While in momentary mode the foot pedal must be held to the side for the vitrector to be enabled. While in toggle mode, the vitrector enables state changes from on to off or from off to on, when the cut enable switch is activated. The toggle/momentary mode selection is made in the utilities menu (see VITRECTOR MOMENTARY/VITRECTOR IS TOGGLE on page 141). The default for the vitrector is toggle mode. When the vitrector surgical function is enabled, the cutter icon will be present, if enabled. The vitrector cutter icon may be disabled using the utilities menu (see CUTTER ICON IS ON/CUTTER ICON IS OFF on page 178). The default for the cutter icon is enabled. The vacuum level will be a linear percentage of the maximum aspiration level. The maximum aspiration level is selected on the console front panel, using the aspiration up and down buttons. For anterior vitrectomy, the

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angular motion of the foot pedal available to control aspiration is reduced by the sum of control ranges #1 and #2. The resolution of the vacuum command will depend upon the maximum aspiration level selected. For smaller values of maximum aspiration, the resolution of the foot pedal command will increase relative to the resolution when larger values of maximum aspiration are selected. The vitrector will cut with or without aspiration.

FOOT CONTROL: Anterior Linear Rate

In anterior linear rate mode, the vitrector cut rate will change linearly with foot pedal position, and after the irrigation valve is opened the aspiration vacuum will reach a fixed level. As the foot pedal is pressed from the rest position, no action will occur until threshold #1 is reached. When threshold #1 is reached, the irrigation valve will open. If you continue to press down on the foot pedal, when threshold #2 is reached, the aspiration pinch valve will open and a fixed vacuum will be applied to the collection cassette (if the aspiration surgical function is on). In fixed aspiration mode the aspiration vacuum level will reach the specified value after the duration specified by the aspiration rise time parameter (see **ASPIRATION RISE TIME** on page 127). If you continue to press down on the foot pedal, when threshold #3 is reached the vitrector will start cutting at the maximum rate (if enabled using the cut enable switch). The remaining angular motion of the foot pedal is available to control the vitrector cut rate. The vitrector cut rate will change linearly from the maximum cut rate to the minimum cut rate as the foot pedal is depressed. The minimum cut rate is reached when the foot pedal is fully depressed. The maximum vitrector cut rate is specified on the console front panel, using the vitrector up and down buttons. The minimum cut rate is specified in the utilities menu (see **MINIMUM CUT RATE** on page 136). The switch used for the cut enable can either be the left or right side switch. The cut enable switch is specified by selecting the other switch to be used for reflux (see **REFLUX IS ON LEFT/REFLUX IS ON RIGHT** on page 127). The right side switch is the default cut enable switch. Two modes for the vitrector's cut enable switch are available. While in momentary mode the foot pedal must be held to the side for the vitrector to be enabled. While in toggle mode, the vitrector enables state changes from on to off or from off to on, when the cut enable switch is activated. The toggle/momentary mode selection is made in the utilities menu (see **VITRECTOR MOMENTARY/VITRECTOR IS TOGGLE** on page 141). The default for the vitrector is toggle mode. When the vitrector surgical function is enabled, the cutter icon will be present, if enabled. The vitrector cutter icon may be disabled using the utilities menu (see **CUTTER ICON IS ON/CUTTER ICON IS OFF** on page 178). The default for the cutter icon is enabled. The vitrector will cut with or without aspiration.

Stage Button Operation

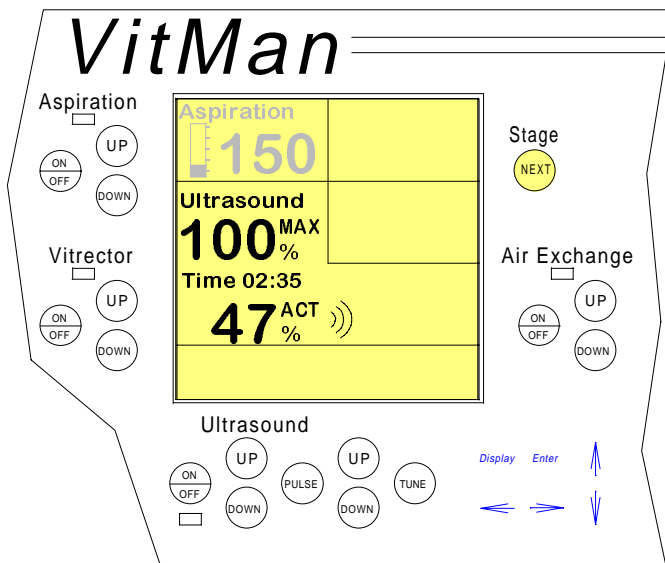


Figure 54. Stage Button

The stage button (see Figure 54) allows the user to quickly move between pre-defined surgical setups. If the stage button is pressed and released, the most recently selected stage number will be displayed. If the stage button is pressed and held, the current stage number will be displayed. If the stage button remains depressed for one second, a tone will sound and a message indicating the newly selected stage will appear. The pre-defined state for the surgical functions of the stage will be placed into effect when the stage button is released. If the stage button is

not released, then two seconds after the tone, a message will be displayed indicating that continuing to hold the stage button will save the current state of the surgical functions as the new definition for the stage indicated. If the stage button is released, then no action will be taken. If the stage button remains depressed for three more seconds, three short tones will sound and the stage indicated will be defined with the current state of the surgical functions. In short, press and release the stage button to see which stage is currently in effect. Press and hold the stage button, then release after the tone, to move to the next stage. Press and hold the stage button for six seconds to redefine the stage.

Initially Defining The Stages

The stage button can be used to redefine any currently active stage. However, when a stage is undefined or disabled, the utilities menu must be used to define a stage. Two methods can be used to define the stages. Since the saving stage command will save the current surgical function's state, you can select the desired surgical functions and their desired operating values, then enter the utilities menu and save the stage. This method requires you to enter and leave the utilities menu for each stage to be defined. An easier method is to enter the utilities menu, go to the save stages menu and save the current state of the surgical functions in the number of stages you wish to define. Then exit the utilities menu and use the stage button to redefine the stages.

EQUIPMENT SETUP & OPERATION

To enter the utilities menu, press and hold the blue “Display” button, located in the lower right corner of the Syntec VitMan. After one second the main menu help screen will display. After reading the help screen, press the right arrow button to move to the main menu. The dark band is the utilities menu cursor. The up and down arrow buttons can be used to place the cursor over items within the menu. The right arrow character found at the end of a menu item indicates that pressing the right arrow button will move to another menu list. With the cursor on the “Select User” menu item, press the right arrow button. This will display the select user menu list. Using the down arrow button, place the cursor over the menu item “Modify Stages”. Press the right arrow button to enter the modify stages menu list. Here you will find three menu items that can be used to determine the effect of the stage button, or modify the effect of the stage button. The “Display Stages” menu item can be used to enter a menu that allows you to view the state individual stages. The “Save Stages” menu item will allow you to enter a menu that will allow the definition of the stages. The “Disable/Enable Stage” menu item will allow you to enter a menu that can be used to enable or disable pre-defined stages.

To initially define a stage, enter the “Save Stages” menu by placing the cursor over the “Save Stages” menu item and then pressing the right arrow button. Use the up and down arrow buttons to place the cursor over the desired stage number. Pressing the right arrow button will display the “Saving Stage” help screen. Pressing the right arrow button again will enter the saving stage command. Pressing the enter button will save the current surgical functions state in the selected mode and enable the stage. Repeat this procedure for the number of stages desired. Now exit the utilities menu by pressing the “Display” button. Press and release the stage button. This will display the stage number that will be redefined. If the message “No stage selected” appears, you will need to select the stage to define. This is done by pressing and holding the stage button until a tone sounds. After the tone, releasing the stage button will select the first enabled stage. Now turn on (or off) all the desired surgical functions and adjust their values to the desired settings. Now press and hold the stage button until three short tones sound. Note that after being held for one second a single tone will sound. If the stage button is released at this point, the next stage will be placed into effect and all the work you put into to defining this stage will be lost. After the three short tones sound, release the stage button. The stage is now defined. To move to the next stage to define, press and hold the stage button until the single tone sounds and then release the stage button. Change the surgical functions to the desired state. Press and hold the stage button until three short tones sound. Repeat until all the stages are defined.

Removing A Stage

If it is not desirable to enter a stage while using the stage button, the stage can be disabled. A stage that has been disabled can later be enabled, with no

EQUIPMENT SETUP & OPERATION

change to the stage definition. A stage can only be disabled in the utilities menu. To enter the utilities menu, press and hold the blue “Display” button. After one second the main menu help screen will display. Press the right arrow button to move to the main menu. The up and down arrow buttons can be used to place the cursor over items within the menu. With the cursor on the “Select User” menu item, press the right arrow button. This will display the select user menu list. Using the down arrow button, place the cursor over the menu item “Modify Stages”. Press the right arrow button to enter the modify stages menu list. Using the down arrow button, place the cursor over the menu item “Disable/Enable Stage”, and press the right arrow button. This will display the help screen that describes how to identify and change the state of a toggle entry. Place the cursor over the menu item corresponding to the stage that needs to be disabled. Pressing the “Enter” button will change the state of the stage from enabled to disabled. Note that the state of a stage that is undefined cannot be modified in the “Disable/Enable Stage” menu, the “Save Stages” menu must be used to initially define the stage.

Clearing A Stage

If the definition of a stage is no longer desired, the stage can be cleared. Once a stage has been cleared, it is marked as undefined, and can only be enabled using the “Save Stages” menu in the utilities menu. A stage can only be cleared using the utilities menu. To enter the utilities menu, press and hold the blue “Display” button. After one second the main menu help screen will display. Press the right arrow button to move to the main menu. The up and down arrow buttons can be used to place the cursor over items within the menu. With the cursor on the “Select User” menu item, press the right arrow button. This will display the select user menu list. Using the down arrow button, place the cursor over the menu item “Modify Stages”. Press the right arrow button to enter the modify stages menu list. Using the down arrow button, place the cursor over the menu item “Clear Stages”, and press the right arrow button. This will display the clear stages menu list. The clear stages menu list has items used to clear all stages or clear an individual stage. To clear all stages, for the current active user, place the cursor over the “Clear All Stages” menu item and press the right arrow button. This will display the clear all stages help screen. Pressing the right arrow button again will move past the help screen and enter the clear all stages command. To clear all stages for the current active user, press the “Enter” button. To clear an individual stage, for the current active user, place the cursor over the menu item corresponding to the stage that needs to be cleared, then press the right arrow button. This will display the help screen for the clear stage command. Pressing the right arrow button again will move past the help screen and enter the clear stage command. Pressing the “Enter” button will clear the stage of the current active user.

Chapter 3: DISPLAY & UTILITIES MENU CONTROL

DISPLAY CONTROLS OVERVIEW

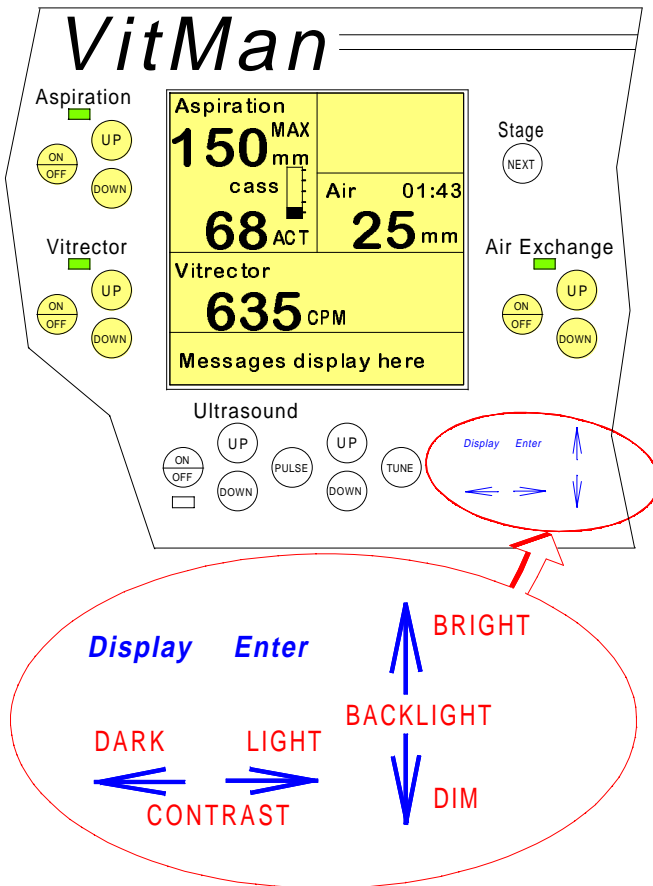


Figure 55 shows the function of the display controls buttons when not in utilities menu. The extra labels (shown in red) are for illustration purposes only. They show how the buttons labeled with the blue arrows control the display contrast and back light brightness.

The *Display* button is used to enter the utilities menu. To reduce the chance of accidental entry into the utilities menu, the *Display* button must be pressed and held for one second. When continuous tone mode is selected for error or warning tones, the *Enter* button serves as an alarm cut off switch. Any errors or warnings present when the *Enter* button is pressed will be disabled. A disabled alarm condition will be automatically enabled when the alarm

condition is removed.

Figure 55. Front Panel Controls & Indications

Again, for illustration purposes only, the display is shown with Aspiration, Vitrector, and Air Exchange functions active.

FRONT PANEL

Display
Enter
Left Arrow
Right Arrow
Up Arrow
Down Arrow

FUNCTION

Depress for one second to enter the Utilities Menu
Alarm Cut Off
Contrast Control: Darker
Contrast Control: Lighter
LED & Back light Control: Brighter
LED & Back light Control: Dimmer

DISPLAY & UTILITIES MENU OPERATION

UTILITIES MENU CONTROLS OVERVIEW

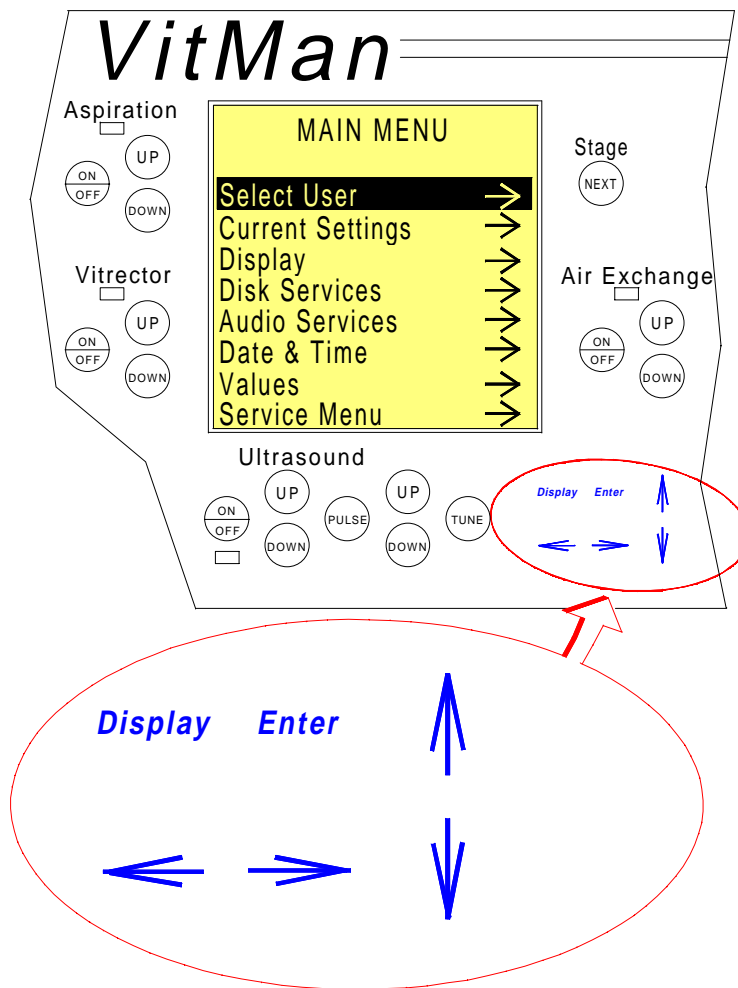


Figure 56 shows the screen viewing area when the blue Display button is depressed and held for one second. The utilities menu consists of eight items that are separately identified by the inverse video horizontal cursor. Depressing the Display button again will exit the utilities menu.

For the purpose of describing the control action of the blue buttons, they will be named in the text corresponding with their physical label on the front panel as follows:

**Figure 56. Front Panel Controls & Indications:
Display**

<u>FRONT PANEL</u>	<u>FUNCTION</u>
Display	Exit Utilities Menu
Enter	Save modified value or select an alternate mode
Left Arrow	Adjust Left or selects a previous, higher level menu
Right Arrow	Adjust Right or selects a submenu of command
Up Arrow	Traverse a menu or increase a value
Down Arrow	Traverse a menu or decrease a value

The up arrow and down arrow will move the text menu vertically up and down the screen. The inverse video cursor remains stationary near the top of the screen. With an item identified by the cursor, depressing the blue horizontal arrows select various submenus. Depressing the RIGHT ARROW selects a submenu. Depressing the LEFT ARROW SELECTS the previous, higher level menu.

DISPLAY & UTILITIES MENU OPERATION

The left and right arrows serve another purpose. Depressing RIGHT ARROW will move to a value adjustment screen, when the horizontal cursor is on certain menu items, for example Current Settings \ Aspiration Values \ Aspiration Level. Aspiration Level is one of the menu items in the aspiration values submenu directly below Current Settings in the Main Menu. When in a value adjustment screen, depressing the UP ARROW and DOWN ARROW will change the displayed value.



NOTE: While the menu, submenu, and value adjustment screens are on the display, all surgical functions remain active! Therefore depressing the yellow up/down buttons on a surgical function may also change the adjustment values, although this is not the recommended method.

Depressing ENTER will save the adjustment value and move the display back to the previous screen. If the LEFT ARROW is depressed, then the value adjustment is discarded and the display moves back to the previous screen.

See Appendix A: MAIN MENU on page 95 for the utilities menu command details. The table of contents for Appendix A, which begins on page 2, provides an indented utilities menu command tree.

Chapter 4: ACCESSORIES DESCRIPTION

COLLECTION CASSETTE

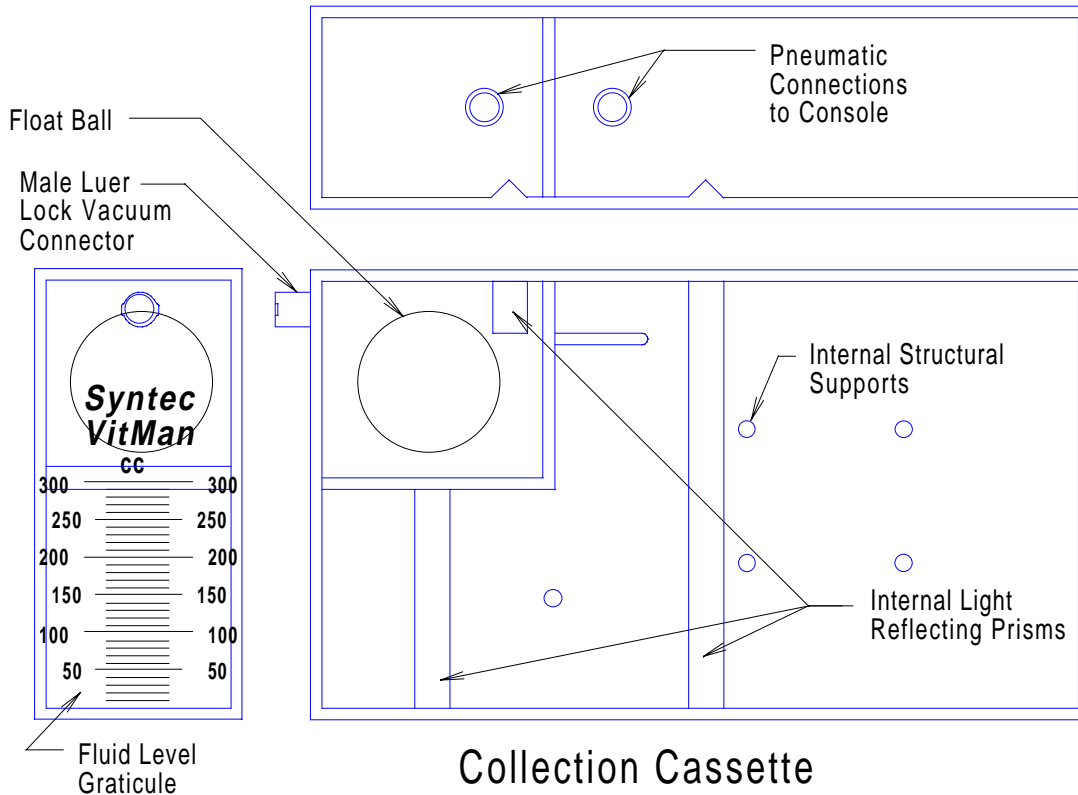


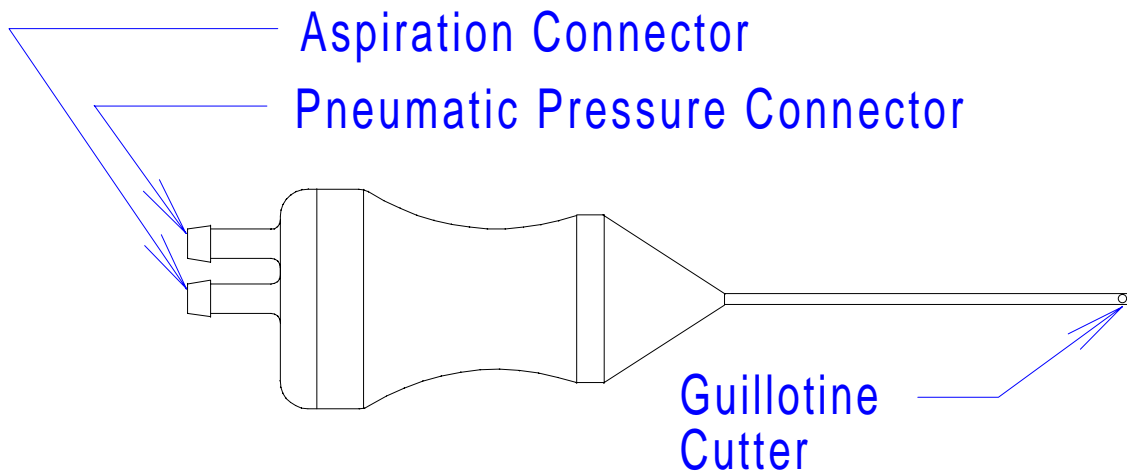
Figure 57. Accessories-Collection Cassette

The collection cassette shown in Figure 57 is an integral part of the innovative Syntec VitMan[®] aspiration system. The cassette capacity is 300 cc or milliliters. The Syntec VitMan[®] control system senses cassette fluid level and provides warnings when the cassette is full. The cassette is shipped as a sterile item and is considered disposable, not reusable.

The above diagram shows the vacuum connection for the disposable tubing on the front of the cassette. The cassette is held in place by a mechanical locking mechanism in the forward section of the Syntec VitMan[®] console.

ACCESSORIES DESCRIPTION

VITRECTOMY CUTTER



Vitrector

Figure 58. Accessories-Vitrectomy Cutter

The vitrectomy cutters available from Syntec are shipped sterile, with disposable tubing connected to both the positive pressure input port and the aspiration port. Luer fittings on the disposable tubing connect to ports on the Syntec VitMan[®] console front panel.

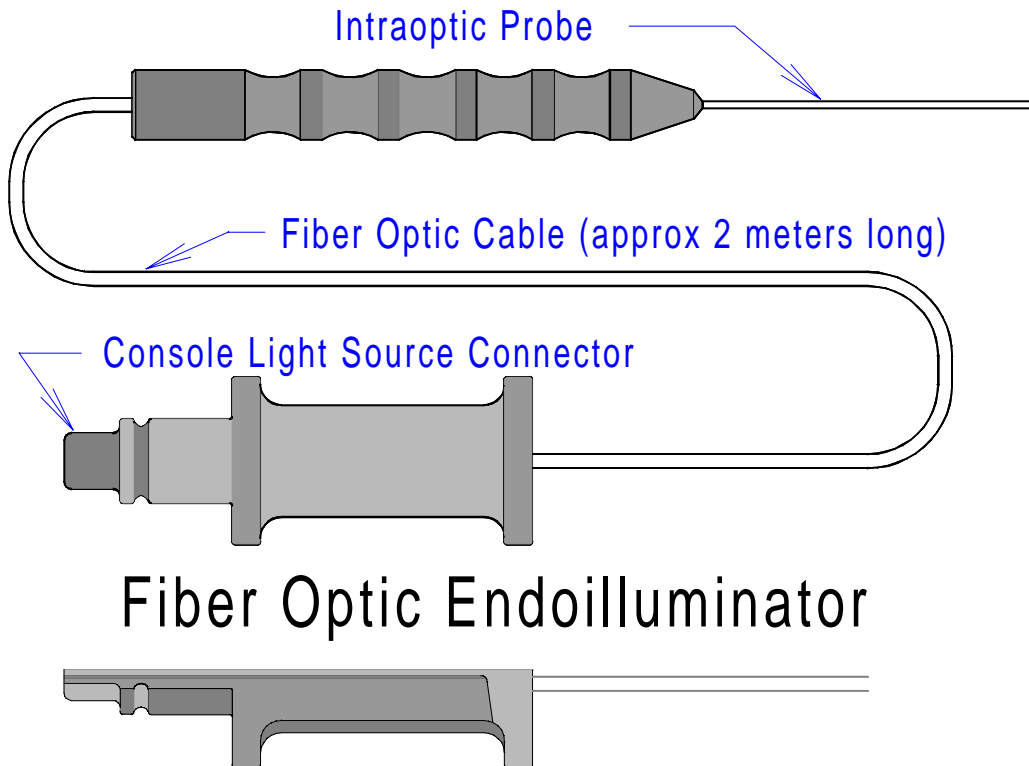
The Syntec VitMan[®] vitrectomy control system is capable of driving positive pressure pulses at 2000 cuts per minute (CPM). However, for some vitrector styles the system performance is limited by the vitrector internal mechanism. The 30 psi, guillotine type vitrectors available from Syntec have different performance ratings (see table below), and require the system to be configured for the style used. The system can be configured for the vitrector style in use by using the utilities menu (see PICK VITRECTOR STYLE, BY REORDER NUMBER on page 146).

Reorder Number	Maximum Cut Rate (CPM)	Tested Cut Rate (CPM)
1024	2000	2000
1025,1026, 1027	1200	750
1022, 1023	1500	750
1020, 1021	1500	750

The vitrector is a disposable item and is not considered reusable.

ACCESSORIES DESCRIPTION

FIBER OPTIC ENDOILLUMINATOR



Fiber Optic Endoilluminator

Figure 59. Accessories-Fiber Optic Endoilluminator

The fiber optic endoilluminator is shown in Figure 59. It channels the light output from the Syntec VitMan[®] triple output light source into the eye. Three fibers may simultaneously be connected to the light source. Each will have the same light intensity output.

The light intensity is controlled from the console front panel, by a true white light dimming mechanism. All three fibers will be controlled at the same intensity level.

The fiber optic endoilluminator is shipped as a sterile item. It is considered a disposable item and is not recommended for reuse.

ACCESSORIES DESCRIPTION

POSTERIOR ULTRASOUND HANDPIECE

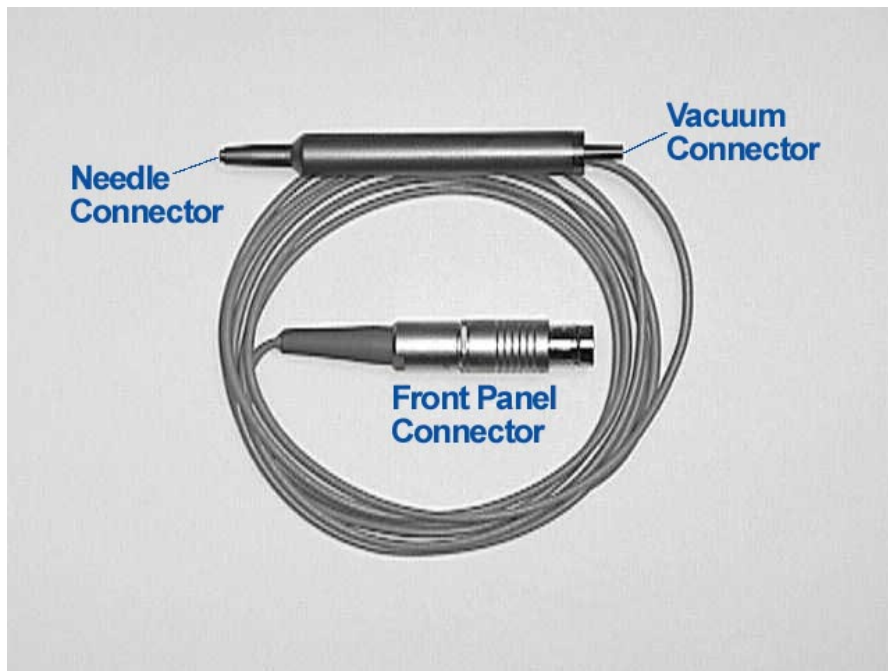


Figure 60. Accessories-Posterior Ultrasound Handpiece

The posterior ultrasound handpiece shown in Figure 60 is used for lens fragmentation. Its operating frequency is approximately 40 kHz. At 100 % power, it consumes approximately 40 electrical watts. The maximum sine wave voltage applied to the handpiece is less than 250 Vrms. The internal electrical connections are fully insulated.

The handpiece housing is made of lightweight titanium. The handpiece weighs approximately 3 ounces, excluding the electrical cord and connector.

The electrical connector plugs into the console front panel at the connector labeled "Ultrasound". The connector is keyed for easy reliable insertion. Vacuum tubing is connected to the male luer connector at the back of the handpiece. The lens fragmentation needle connects to the threaded opening at the front of the handpiece.



WARNING: The posterior ultrasound handpiece must be sterilized prior to each use and it must be cleaned after each use. See CARE & HANDLING OF ACCESSORIES - ULTRASOUND HANDPIECES on page 90.

ACCESSORIES DESCRIPTION

ANTERIOR ULTRASOUND HANDPIECE

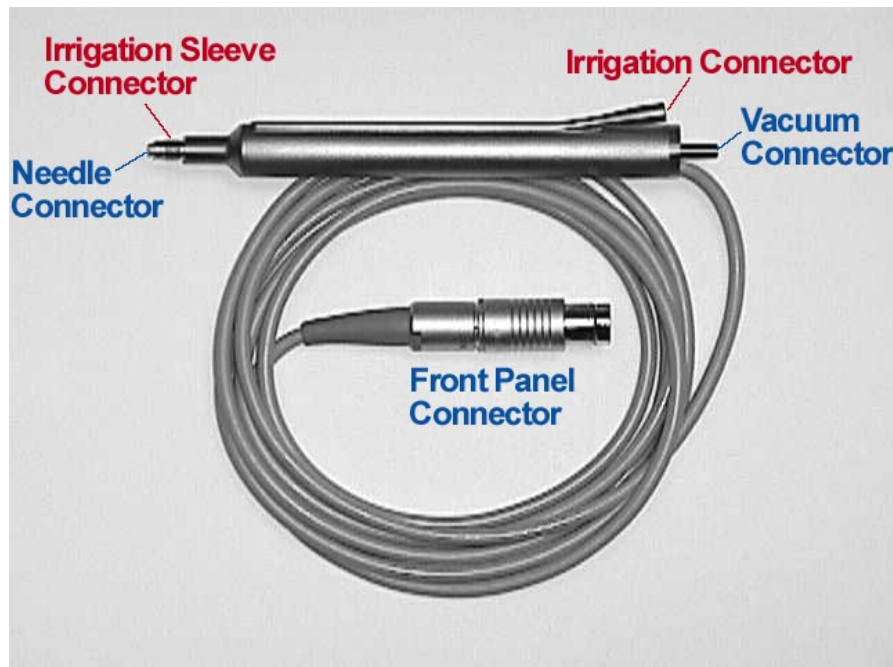


Figure 61. Accessories-Anterior Ultrasound Handpiece

The anterior ultrasound handpiece shown in Figure 61 is used for phacoemulsification. Its operating frequency is approximately 40 kHz. At 100 % power, it consumes approximately 40 electrical watts. The maximum sine wave voltage applied to the handpiece is less than 250 Vrms. The internal electrical connections are fully insulated.

The handpiece housing is made of lightweight titanium. The handpiece weighs approximately 3 ounces, excluding the electrical cord and connector.

The electrical connector plugs into the console front panel at the connector labeled "Ultrasound". The connector is keyed for easy reliable insertion. Vacuum tubing connects to the male luer connector at the back of the handpiece. Irrigation tubing connects to the female luer connector at the back of the handpiece. The phacoemulsification needle connects to the threaded opening at the front of the handpiece, and the irrigation sleeve is threaded onto the shell just to the rear of the needle connection.



WARNING: The anterior ultrasound handpiece must be sterilized prior to each use and it must be cleaned after each use. See CARE & HANDLING OF ACCESSORIES - ULTRASOUND HANDPIECES on page 90.

Chapter 5: CARE & HANDLING OF ACCESSORIES

STERILIZATION INSTRUCTIONS

Common Sterilization Parameters for steam autoclavable instruments:

Sterilization Method	Condition	Recommended Duration
Gravity Displacement Steam	121°C(250°F)	30 minutes
Gravity Flash Steam	132°C(270°F)	10 minutes (minimum exposure time)

CASSETTE

THE CASSETTE IS NOT DESIGNED TO BE A REUSABLE ITEM. IT IS SHIPPED AS A STERILE ITEM.

TUBING

THE TUBING IS NOT DESIGNED TO BE A REUSABLE ITEM. IT IS SHIPPED AS A STERILE ITEM.

VITRECTOMY CUTTER

THE VITRECTOMY CUTTER IS NOT DESIGNED TO BE A REUSABLE ITEM. IT IS SHIPPED AS A STERILE ITEM.

FIBER OPTIC ENDOILLUMINATOR

THE FIBER OPTIC ENDOILLUMINATOR IS NOT DESIGNED TO BE A REUSABLE ITEM. IT IS SHIPPED AS A STERILE ITEM.

CARE & HANDLING OF ACCESSORIES

ULTRASOUND HANDPIECES

1. Disconnect tubing.
2. Remove and discard ultrasound needle and irrigation sleeve, if applicable.
3. Flush irrigation lumen, if applicable, with minimum of 3cc distilled or de-ionized water.
4. Expel water from irrigation lumen using air.
5. Flush aspiration lumen with minimum of 3cc distilled or de-ionized water.
6. Expel water from aspiration lumen using air.
7. Fill lumens (aspiration and irrigation) with enzymatic presoak solution (for example ENDOZIME™ by Ruhof Corporation or equivalent) and let soak for 2-3 minutes.
8. Expel solution from lumens using air.
9. Clean the outside of the handpiece with a wipe moistened in enzymatic pre-soak solution.
10. Clean the outside of the handpiece with a wipe moistened with distilled or de-ionized water.
11. Flush irrigation lumen, then aspiration lumen with a minimum of 3cc each of distilled or de-ionized water. Repeat for a total of three times.
12. Expel water from lumens using air.
13. Sterilize using one of the following processes. Note that the handpiece may be wrapped in one layer of Central Supply and Receiving (CSR) wrap prior to sterilization. Wrapping should be performed according to *Good Hospital Practice: Steam Sterilization and Sterility Assurance*, AAMI SSSA-1988.

Sterilization Method	Condition	Recommended duration
Gravity Displacement Steam	121°C(250°F)	30 Minutes
Gravity Flash Steam	132°C(270°F)	10 Minutes

Chapter 6: EQUIPMENT TROUBLESHOOTING

ELECTRICAL POWER

Normally problems with electrical power are caused by an improper connection at the power entry module on the back panel. Check to make sure that the power cord is seated properly. If electrical power is still not present, check the input fuse.



WARNING: TURN OFF THE ELECTRICAL POWER AND REMOVE THE POWER CORD BEFORE ATTEMPTING TO ACCESS THE INPUT FUSE HOLDER.

Open the fuse holder panel on the right side of the power entry module. Pull out the fuse holder block. There are either two fuses or one fuse and a shorting tab mounted in the holder block, depending on the local electrical code. Replace the fuses and return the holder block to its normal position in the power entry module. Close the fuse holder panel and reinsert the electrical power cord.

Turn on the power switch and observe the operation of the console. If the power problem still persists, call the service representative for assistance.

FRONT PANEL DISPLAY

Since complete control over contrast and brightness is available to the user, it may be necessary to adjust the contrast and brightness to suit personal preference. Remember also that the display will only be easily visible within a distance of about 2½ meters. The viewing angle will also greatly affect the apparent sharpness of the displayed characters. If the viewing angle exceeds 45 degrees in either direction from straight ahead, then the contrast will appear to wash out. If the available controls do not respond to your satisfaction, contact a service representative.

IRRIGATION

If irrigation fluid stops, check the fluid bottle to make sure it is not empty. In addition, the spike filter may have become clogged. Check all disposable tubing lines for obstructions or kinks. It is also possible that the surgical instrument has become clogged, for example the vitrector or fragmentation handpiece.

EQUIPMENT TROUBLESHOOTING

ASPIRATION

If aspiration appears weak or stops completely, check the console display for warning messages. For example, if the foot pedal connection becomes corrupt, aspiration will be forced to zero, and the message “No foot pedal present” will be present. This condition is most likely due to the foot pedal being disconnected or to a broken electrical connection. Check the display value to see that actual vacuum is in the expected range.

If front panel display information appears normal, check the disposable lines and connections to surgical instruments and to the collection cassette on the front of the console.

If the surgical instrument is suspect, remove the instrument from the eye. Immerse the front of the instrument in a bowl of sterile water. Set the aspiration vacuum to its highest value, 500 mmHg. Press the foot pedal all the way down and observe the aspiration tubing and cassette for about 30 seconds. If the fluid is not entering the cassette at a reasonably quick pace, replace the surgical instrument.

AIR EXCHANGE

If the Air Exchange does not appear to function properly, check the console display for warning messages. Check the display values to see that eye pressure is in the expected range. If front panel display information appears normal, check the disposable lines and connections to the AIR port on the front of the console. The air filter may have become clogged.

VITRECTOMY

If the vitrector does not appear to function properly, check the console display for warning messages. Check the display values to see that aspiration is in the expected range. A malfunction in aspiration will dramatically affect the performance of the vitrector. If a malfunction in aspiration is apparent, follow the procedure in Aspiration Troubleshooting.

If aspiration is acceptable, check the front panel display for vitrector warning messages. If display indications are normal, check the positive pressure disposable tubing connections at the Vitrector port on the front panel. Also, check the tubing for obstructions. If all display indications and tubing appear normal, replace the vitrector.

EQUIPMENT TROUBLESHOOTING

ILLUMINATION

If illumination does not appear to function properly, check the console display for warning messages. Replace the bulb if necessary (Reorder #1090). Be very careful that the bulb is not hot before it is removed. Do not touch the bulb with bare fingers.

If display indications are normal, check the intensity control knob on the front of the light source. If the intensity is set at maximum and the illumination output is not adequate, check the fiber optic cable for kinks.

Turn off the light source, open the light source drawer and visually check the bulbs. The bulbs should be clear and not cloudy. Replace the bulb if necessary (Reorder #1090). Be very careful that the bulb is not hot before it is removed. Do not touch the bulb with bare fingers.

If all other indications are normal, replace the fiber optic endoilluminator.

ULTRASOUND LENS FRAGMENTATION

If the ultrasound does not appear to function properly, check the console display for warning messages. Check the display values to see that aspiration is in the expected range. Similar to the vitrector, a malfunction in aspiration will dramatically affect the performance of the ultrasound handpiece. If a malfunction in aspiration is apparent, follow the procedure in Aspiration Troubleshooting.

If aspiration is acceptable, check the front panel display for ultrasound warning messages. If the handpiece has become inadvertently disconnected, reconnect and retune it.

If display indications are normal, try adjusting the power level to improve the performance. If power adjustments are unsuccessful, try retuning the handpiece, even if there was no indication that it had become disconnected. If an alarm condition results after tuning the handpiece, or if the tuning cycle is complete and the handpiece performance has not improved, then replace the handpiece.

Chapter 7: ROUTINE EQUIPMENT MAINTENANCE

ELECTRICAL FUSE REPLACEMENT

The electrical input fuses are located inside the power entry module located on the console back panel.



WARNING: TURN OFF THE ELECTRICAL POWER AND REMOVE THE POWER CORD BEFORE ATTEMPTING TO ACCESS THE INPUT FUSE HOLDER.

Use a small flat head screwdriver to pry open the latch on the right side of the power entry module. With the latch open, pull out the fuse holder block. There are either two fuses or one fuse and a shorting tab mounted in the holder block, depending on the local electrical code. Replace the fuses and return the holder block to its normal position in the power entry module. Replace the fuse holder, close the latch and reconnect the power cord.

ILLUMINATION SOURCE BULB REPLACEMENT

To replace the light source bulbs, first turn off the main power switch on the console. **WAIT FOR THE UNIT TO COOL.** Rotate the mechanical locking knob counter clockwise to release the light source assembly. Pull the assembly forward until it stops. Two bulbs are located between the forward lenses and the back reflecting mirror.



WARNING: THE BULBS MAY BE HOT! Do not touch the bulb with bare fingers.

To replace a bulb, grasp it firmly and pull straight up until it releases from its mounting plate. Reinsert a new bulb (Reorder #1090) into the mounting plate.



IT IS IMPORTANT TO SEAT THE BULB WITH STRAIGHT DOWNWARD PRESSURE WITHOUT TWISTING. The bulb will seat firmly into the mounting plate.

After replacing the bulb, slide the light source assembly back into place in the console. Rotate the locking knob clockwise to seat the light source assembly firmly in place. Turn on the main power switch, test the light source, and reset the bulb hours with the display control buttons.

Appendix A: MAIN MENU

When the *Display* button is pressed and held for one second the MAIN MENU help screen will appear (see Figure 62). This screen describes how to exit the utilities menu, as well as, how to traverse the menu. The text in the menu border indicates that pressing the RIGHT ARROW button will exit the help screen and enter the main menu, however the LEFT ARROW, UP ARROW, DOWN ARROW and *Enter* buttons may also be used. The *Display* button may always be used to exit the utilities menu. The *Enter* button can also be used to save the contents of the LCD display. When the *Enter* button is pressed and held for ½ second, a .PCX file will be created on the floppy disk. The file name VITxxxxx.PCX, where xxxxx is a five digit decimal number, will be used.

After exiting the help screen, the MAIN MENU will be displayed. This menu splits all of the menu commands into eight general categories (see Figure 63). The inverse video bar is the menu stage cursor. The UP ARROW and DOWN ARROW buttons can be used to move the cursor up and down within the menu list. The right arrow at the end of a menu item indicates that pressing the RIGHT ARROW will move to another menu list. The *Enter* button can also be used to move to the next menu list, however, the *Enter* button should only be used to confirm a requested change to the device configuration. If the *Enter* button is not pressed then any changes made will not be saved.

The following discussion of the menu items assumes that help is enabled. If help is disabled, then the RIGHT ARROW button press to move past the help screen will not be required. Note that help may be enabled and disabled in the “Display” menu. If help is disabled, only the main menu help screen will be displayed.

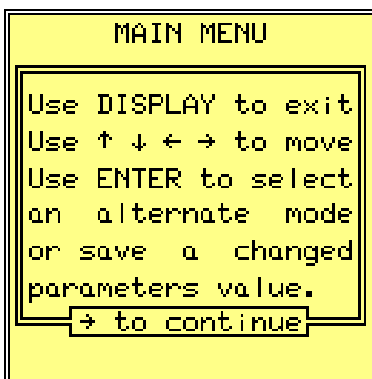


Figure 62

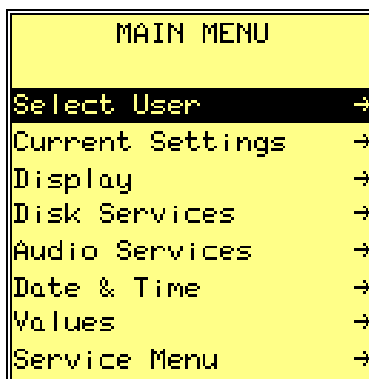


Figure 63

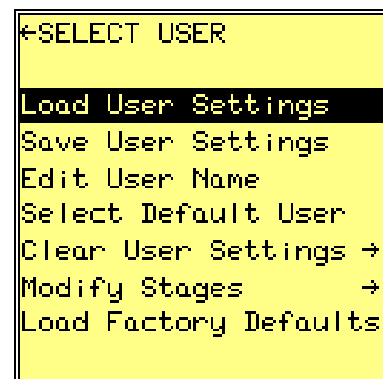


Figure 64

SELECT USER

SELECT USER

The select user menu has entries used to load and save the active configuration area. With the cursor on the “Select User” menu item (see Figure 63), pressing the RIGHT ARROW button will display the select user menu list (see Figure 64). At the top of the display, the text SELECT USER indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position. To exit the utilities menu, press the *Display* button.

Any changes to the device configuration are automatically saved in the active configuration. The active configuration is also used to configure the device when powered up. The Syntec VitMan can internally save the active configuration in twelve independent user configurations. The “Save User Settings” menu item can be used to save the active configuration in one of twelve user configurations. The “Load User Settings” menu item can be used to load a previously saved user configuration into the active configuration area. The “Edit User Name” menu item can be used to change the active configuration user name. The “Load Factory Defaults” menu item can be used to load the factory defaults for the entire active configuration.

LOAD USER SETTINGS

The load user settings command can be used to move a previously saved user configuration into the active configuration area. With the cursor on the “Load User Settings” menu item (see Figure 64), pressing the RIGHT ARROW will display the load user help screen (see Figure 65). Pressing the RIGHT ARROW button again will move past the help screen to the “Load User” command (see Figure 66). When the load user command is entered, the current user number is zero. User zero refers to the active configuration and pressing *Enter* will have no effect. Also displayed is the active user name text. When the UP ARROW is pressed, the user number is incremented and the user name text will be displayed. If the user name text is “<<< Unused Entry >>>”, then this entry is unused. Pressing the *Enter* button when an unused entry is displayed will have no effect. When the entry contains a valid configuration, pressing the *Enter* button will cause the active configuration to be overwritten. Note that the effect on active surgical functions is immediate. If you wish to leave the load user settings command without modifying the active configuration, press the LEFT ARROW button. To exit the utilities menu, press the *Display* button.

SELECT USER

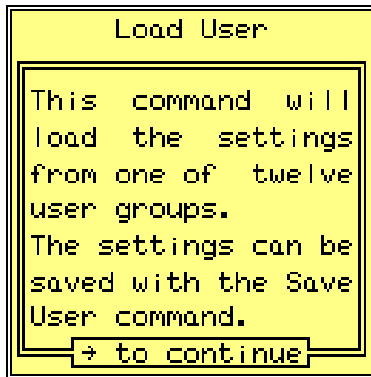


Figure 65

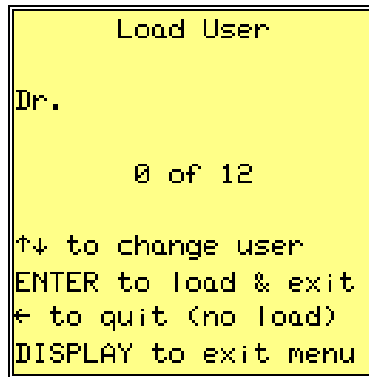


Figure 66

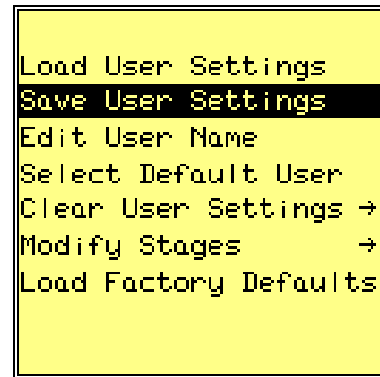


Figure 67

SAVE USER SETTINGS

The save user settings command will save the active configuration in one of twelve user areas. With the cursor on the “Save User Settings” menu item (see Figure 67), pressing the RIGHT ARROW will display the save user help screen (see Figure 68). Pressing the RIGHT ARROW button again will move past the help screen to the “Save User” command (see Figure 69). When the save user command is entered, the current user number is zero. User zero refers to the active configuration and pressing *Enter* will have no effect. Also displayed is the active user name text. When the UP ARROW is pressed, the user number is incremented and the user name text for the currently saved configuration will be displayed. If the user name text is “<<< Unused Entry >>>”, then this entry is unused. Pressing the *Enter* button will save the active configuration in the selected entry. If you wish to leave the save user settings command without saving the active configuration, press the LEFT ARROW button. To exit the utilities menu, press the *Display* button.

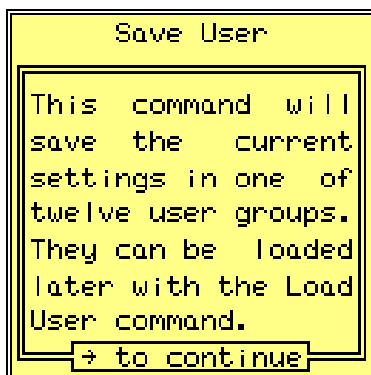


Figure 68

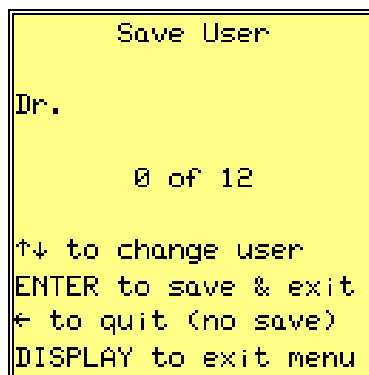


Figure 69

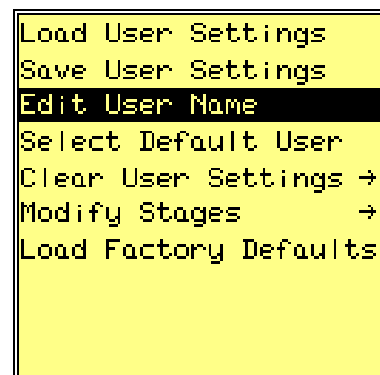


Figure 70

SELECT USER

EDIT USER NAME

The edit user name command can be used to edit the user name text. With the cursor on the “Edit User Name” menu item (see Figure 70), pressing the RIGHT ARROW will display the edit user name help screen (see Figure 71). Pressing the RIGHT ARROW button again will move past the help screen to the “Edit User Name” command (see Figure 72). The LEFT ARROW and RIGHT ARROW buttons can be used to move the cursor to another character position. The UP ARROW and DOWN ARROW buttons will change the character. Once the user name has been modified, pressing the *Enter* button will save the changes. If the LEFT ARROW button is pressed while the cursor is on the left most character position, edit stage is terminated. If the user name was modified and termination is selected, a warning screen will display (see Figure 73). If the LEFT ARROW is pressed, any changes will be lost. If the *Enter* button is pressed, the changes will be saved. To exit the utilities menu, press the *Display* button.

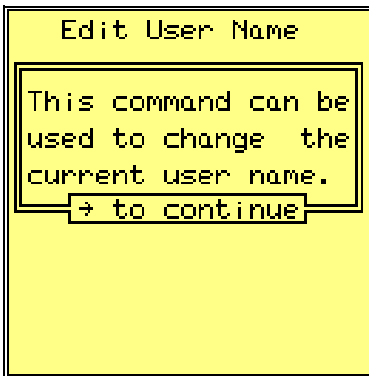


Figure 71

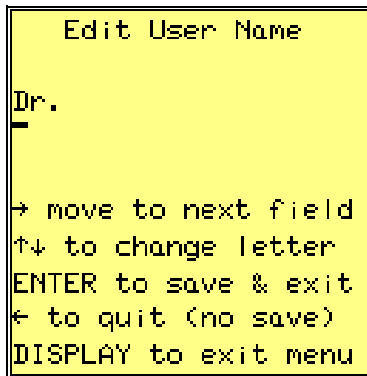


Figure 72

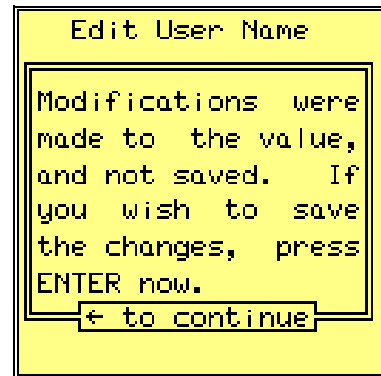


Figure 73

SELECT DEFAULT USER

The select default user command can be used to select a previously saved user configuration to be loaded into the active configuration area when the VitMan is powered up. If when powered up, the active configuration area was loaded from a diskette present in the disk drive or if the VitMan was powered down less than five minutes, the active configuration will not be loaded with the default user selection. With the cursor on the “Select Default User” menu item (see Figure 74), pressing the RIGHT ARROW will display the select default user help screen (see Figure 75). Pressing the RIGHT ARROW button again will move past the help screen to the “Select Default User” command (see Figure 76). When the select default user command is entered, the currently selected default user number is displayed. One of twelve user numbers, or user zero, may be selected. User zero refers to the active configuration and the active user name text is displayed. When user zero is selected, the active configuration will not be

SELECT USER

modified when the VitMan is powered up. When the UP ARROW is pressed, the user number is incremented and the user name text for this user will be displayed. When the DOWN ARROW is pressed, the user number is decremented. If the user name text is “<<< Unused Entry >>>”, then this entry is unused. If an unused entry is selected, the active configuration will not be modified at power-up. To save the selected default user, press the *Enter* button. If you wish to leave the select default user command without selecting another user configuration, press the LEFT ARROW button. To exit the utilities menu, press the *Display* button. Unused user configurations may be defined by using the save user settings command. The factory default for the default user selection is user zero, and therefore, the settings present prior to power down will be present when the VitMan is powered up.

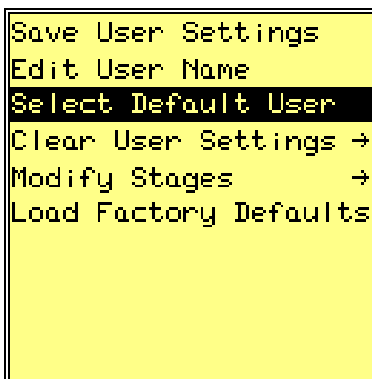


Figure 74

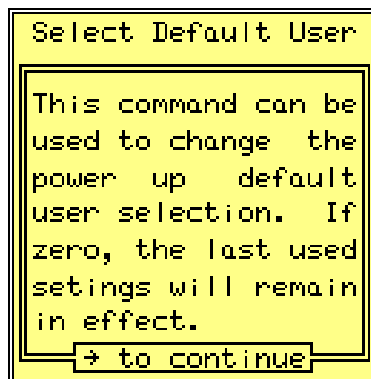


Figure 75

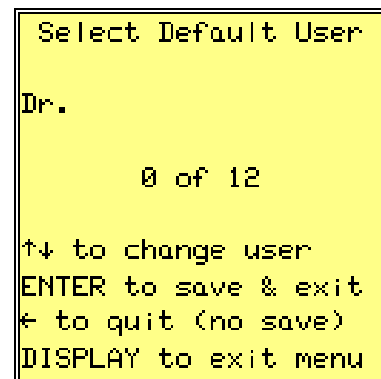


Figure 76

CLEAR USER SETTINGS

The clear user settings menu has items used to clear entries in the user area. With the cursor on the “Clear User Settings” menu item (see Figure 77), pressing the RIGHT ARROW button will display the clear user settings menu list (see Figure 78). At the top of the display, the text CLEAR USER SETTINGS indicates the previous menu selection text. The left arrow preceding the text indicates that pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position. To exit the utilities menu, press the *Display* button

SELECT USER

```
Edit User Name
Select Default User
Clear User Settings →
Modify Stages →
Load Factory Defaults
```

Figure 77

```
←CLEAR USER SETTINGS
Clear Specific User
Clear All Users
```

Figure 78

CLEAR SPECIFIC USER

The clear specific user command can be used to clear a specific user area. With the cursor on the “Clear Specific User” menu item (see Figure 78), pressing the RIGHT ARROW will display the clear specific user help screen (see Figure 79). Pressing the RIGHT ARROW button again will move past the help screen to the “Clear User” command (see Figure 80). When the clear user command is entered, the user number is set to zero. One of twelve user numbers, or user zero, may be selected. User zero refers to the active configuration and the active user name text is displayed. When user zero is selected, the active user will not be cleared. When the UP ARROW is pressed, the user number is incremented and the user name text for this user will be displayed. When the DOWN ARROW is pressed, the user number is decremented. If the user name text is “<<< Unused Entry >>>”, then this entry is unused. If an unused entry is selected, the user is already cleared and no action will be taken. To clear the selected user, press the *Enter* button. If you wish to leave the clear user command without clearing a user area, press the LEFT ARROW button. To exit the utilities menu, press the *Display* button.

```
Clear User

This command will
clear the settings
for one of twelve
user groups.
→ to continue
```

Figure 79

```
Clear User

Dr.

      0 of 12

↑↓ to change user
ENTER to clear & exit
← to quit (no clear)
DISPLAY to exit menu
```

Figure 80

SELECT USER

CLEAR ALL USERS

The clear all users command can be used to simultaneously clear all twelve users in the user area. With the cursor on the “Clear All Users” menu item (see Figure 81), pressing the RIGHT ARROW will display the clear all users help screen (see Figure 82). Pressing the RIGHT ARROW button again will move past the help screen to the “Clear All Users” command (see Figure 83). Press the *Enter* button will clear all users. If you wish to leave the clear all users command without clearing all users, press the LEFT ARROW button. To exit the utilities menu, press the *Display* button.

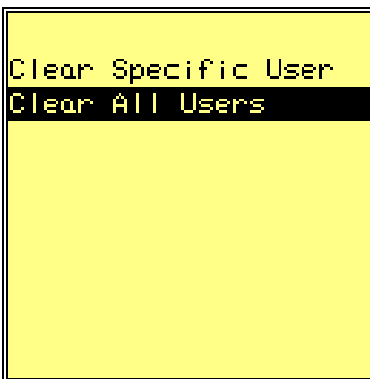


Figure 81

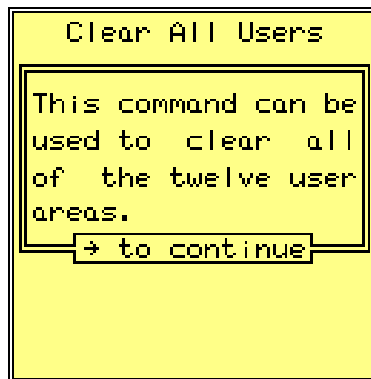


Figure 82

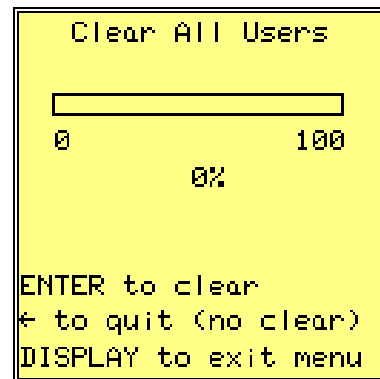


Figure 83

MODIFY STAGES

The modify stages menu has items used to control the stage change button. With the cursor on the “Modify Stages” menu item (see Figure 84), pressing the RIGHT ARROW button will display the modify stages menu list (see Figure 85). At the top of the display, the text MODIFY STAGES indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position. To exit the utilities menu, press the *Display* button.

SELECT USER

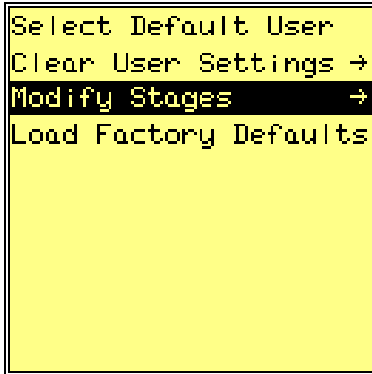


Figure 84

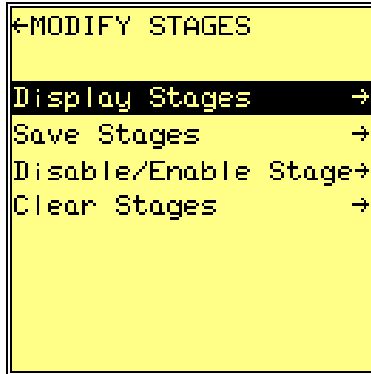


Figure 85

DISPLAY STAGES

The display stages menu has items used to display the state of the stages selectable using the stage change button. With the cursor on the “Display Stages” menu item (see Figure 85), pressing the RIGHT ARROW button will display the display stages menu list (see Figure 86). At the top of the display, the text DISPLAY STAGES indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position. To exit the utilities menu, press the *Display* button.

DISPLAY STAGE 1

The display stage 1 command can be used to display the current state of stage 1. With the cursor on the “Display Stage 1” menu item (see Figure 86), pressing the RIGHT ARROW will display the stage 1 status help screen (see Figure 87). Pressing the RIGHT ARROW button again will move past the help screen to the “Stage 1 Status” display (see Figure 88). The stage 1 status display will show the current status of stage 1. If the stage is enabled, then the stage may be placed into effect using the stage change button. While disabled, the stage can not be accessed using the stage change button. If the stage is defined, the stage 1 status command will also display the state of the surgical functions for the stage. To exit, press the LEFT ARROW button. The Disable/Enable Stage menu can be used to enable and disable the stage. To exit the utilities menu, press the *Display* button.

SELECT USER

*DISPLAY STAGES

Display Stage 1
Display Stage 2
Display Stage 3
Display Stage 4
Display Stage 5
Display Stage 6
Display Stage 7

Figure 86

__Stage 1 Status__

This command will
display the current
state of stage 1.
→ to continue

Figure 87

__Stage 1 Status__

Stage is enabled
Posterior Irrigation
Aspiration is 250mm
Vitrector is 600cpm
Ultrasound is off
Illumination is on
Air Exchange is 50mm

Figure 88

DISPLAY STAGE 2

The display stage 2 command can be used to display the current state of stage 2. With the cursor on the "Display Stage 2" menu item (see Figure 89), pressing the RIGHT ARROW will display the stage 2 status help screen (see Figure 90). Pressing the RIGHT ARROW button again will move past the help screen to the "Stage 2 Status" display (see Figure 91). The stage 2 status display will show the current status of stage 2. If the stage is enabled, then the stage may be placed into effect using the stage change button. While disabled, the stage can not be accessed using the stage change button. If the stage is defined, the stage 2 status command will also display the state of the surgical functions for the stage. To exit, press the LEFT ARROW button. The Disable/Enable Stage menu can be used to enable and disable the stage. To exit the utilities menu, press the *Display* button.

Display Stage 1
Display Stage 2
Display Stage 3
Display Stage 4
Display Stage 5
Display Stage 6
Display Stage 7

Figure 89

__Stage 2 Status__

This command will
display the current
state of stage 2.
→ to continue

Figure 90

__Stage 2 Status__

Stage is enabled
Anterior Irrigation
Aspiration is 100mm
Vitrector is 400cpm
Ultrasound is off
Illumination is off
Air Exchange is off

Figure 91

SELECT USER

DISPLAY STAGE 3

The display stage 3 command can be used to display the current state of stage 3. With the cursor on the “Display Stage 3” menu item (see Figure 92), pressing the RIGHT ARROW will display the stage 3 status help screen (see Figure 93). Pressing the RIGHT ARROW button again will move past the help screen to the “Stage 3 Status” display (see Figure 94). The stage 3 status display will show the current status of stage 3. If the stage is enabled, then the stage may be placed into effect using the stage change button. While disabled, the stage can not be accessed using the stage change button. If the stage is defined, the stage 3 status command will also display the state of the surgical functions for the stage. To exit, press the LEFT ARROW button. The Disable/Enable Stage menu can be used to enable and disable the stage. To exit the utilities menu, press the *Display* button.

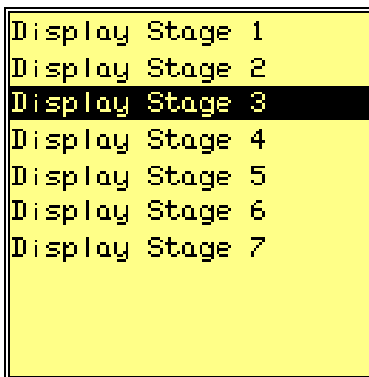


Figure 92

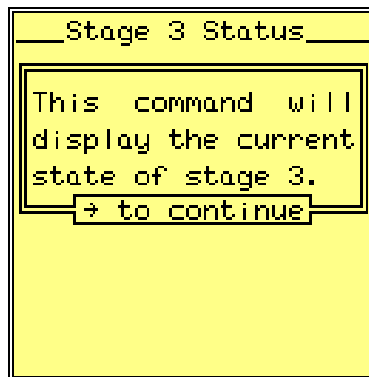


Figure 93

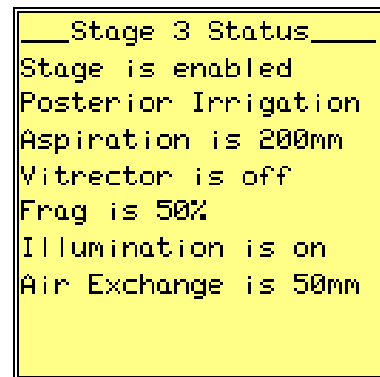


Figure 94

DISPLAY STAGE 4

The display stage 4 command can be used to display the current state of stage 4. With the cursor on the “Display Stage 4” menu item (see Figure 95), pressing the RIGHT ARROW will display the stage 4 status help screen (see Figure 96). Pressing the RIGHT ARROW button again will move past the help screen to the “Stage 4 Status” display (see Figure 97). The stage 4 status display will show the current status of stage 4. If the stage is enabled, then the stage may be placed into effect using the stage change button. While disabled, the stage can not be accessed using the stage change button. If the stage is defined, the stage 4 status command will also display the state of the surgical functions for the stage. To exit, press the LEFT ARROW button. The Disable/Enable Stage menu can be used to enable and disable the stage. To exit the utilities menu, press the *Display* button.

SELECT USER

```
Display Stage 2
Display Stage 3
Display Stage 4
Display Stage 5
Display Stage 6
Display Stage 7
```

Figure 95

```
__ Stage 4 Status __
This command will
display the current
state of stage 4.
→ to continue
```

Figure 96

```
__ Stage 4 Status __
Stage is enabled
Anterior Irrigation
Aspiration is 50mm
Vitrector is off
Linear Phaco is 75%
Illumination is off
Air Exchange is off
```

Figure 97

DISPLAY STAGE 5

The display stage 5 command can be used to display the current state of stage 5. With the cursor on the "Display Stage 5" menu item (see Figure 98), pressing the RIGHT ARROW will display the stage 5 status help screen (see Figure 99). Pressing the RIGHT ARROW button again will move past the help screen to the "Stage 5 Status" display (see Figure 100). The stage 5 status display will show the current status of stage 5. If the stage is enabled, then the stage may be placed into effect using the stage change button. While disabled, the stage can not be accessed using the stage change button. If the stage is defined, the stage 5 status command will also display the state of the surgical functions for the stage. To exit, press the LEFT ARROW button. The Disable/Enable Stage menu can be used to enable and disable the stage. To exit the utilities menu, press the *Display* button.

```
Display Stage 3
Display Stage 4
Display Stage 5
Display Stage 6
Display Stage 7
```

Figure 98

```
__ Stage 5 Status __
This command will
display the current
state of stage 5.
→ to continue
```

Figure 99

```
__ Stage 5 Status __
Stage is enabled
Anterior Irrigation
Aspiration is 100mm
Vitrector is off
Fixed Phaco is 20%
Illumination is off
Air Exchange is off
```

Figure 100

SELECT USER

DISPLAY STAGE 6

The display stage 6 command can be used to display the current state of stage 6. With the cursor on the “Display Stage 6” menu item (see Figure 101), pressing the RIGHT ARROW will display the stage 6 status help screen (see Figure 102). Pressing the RIGHT ARROW button again will move past the help screen to the “Stage 6 Status” display (see Figure 103). The stage 6 status display will show the current status of stage 6. If the stage is enabled, then the stage may be placed into effect using the stage change button. While disabled, the stage can not be accessed using the stage change button. If the stage is defined, the stage 6 status command will also display the state of the surgical functions for the stage. To exit, press the LEFT ARROW button. The Disable/Enable Stage menu can be used to enable and disable the stage. To exit the utilities menu, press the *Display* button.

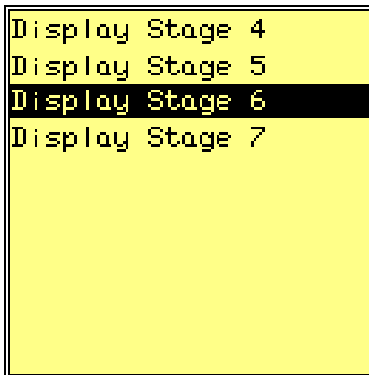


Figure 101

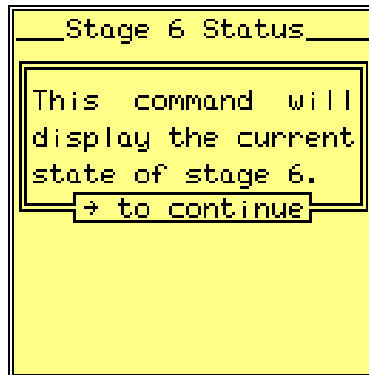


Figure 102

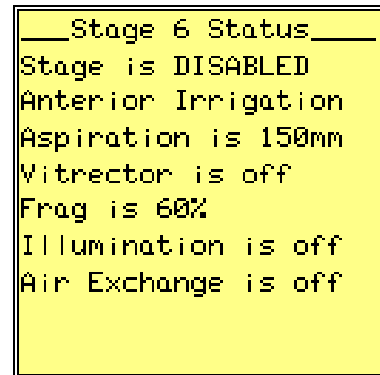


Figure 103

DISPLAY STAGE 7

The display stage 7 command can be used to display the current state of stage 7. With the cursor on the “Display Stage 7” menu item (see Figure 104), pressing the RIGHT ARROW will display the stage 7 status help screen (see Figure 105). Pressing the RIGHT ARROW button again will move past the help screen to the “Stage 7 Status” display (see Figure 106). The stage 7 status display will show the current status of stage 7. If the stage is enabled, then the stage may be placed into effect using the stage change button. While disabled, the stage can not be accessed using the stage change button. If the stage is defined, the stage 7 status command will also display the state of the surgical functions for the stage. To exit, press the LEFT ARROW button. The Disable/Enable Stage menu can be used to enable and disable the stage. To exit the utilities menu, press the *Display* button.

SELECT USER

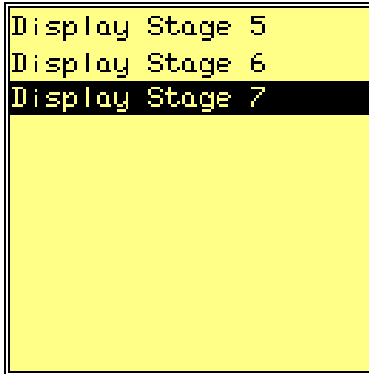


Figure 104

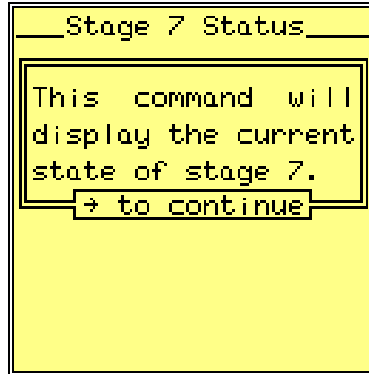


Figure 105

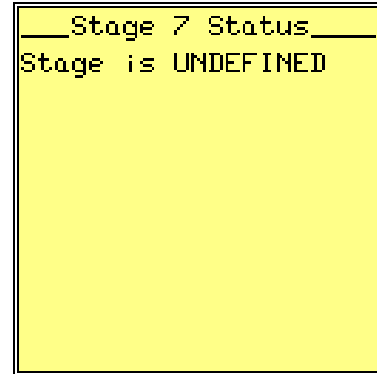


Figure 106

SAVE STAGES

The save stages menu has items used to save the stages that are selectable using the stage change button. With the cursor on the “Save Stages” menu item (see Figure 107), pressing the RIGHT ARROW button will display the save stages menu list (see Figure 108). At the top of the display, the text SAVE STAGES indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position. To exit the utilities menu, press the *Display* button.

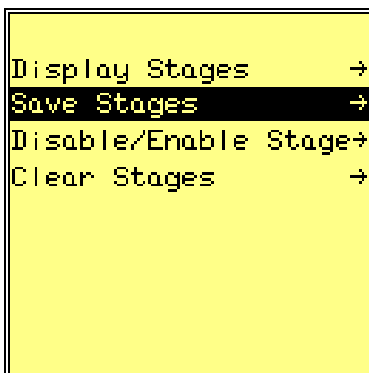


Figure 107

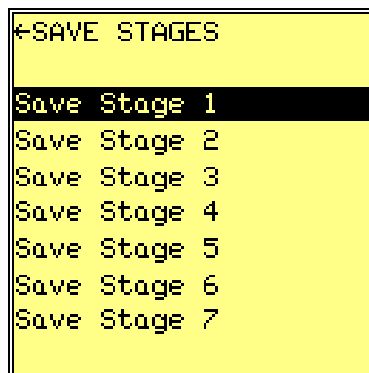


Figure 108

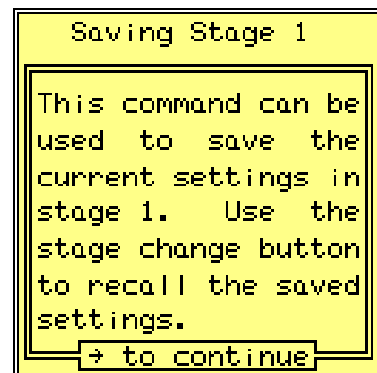


Figure 109

SELECT USER

SAVE STAGE 1

The save stage 1 command can be used to save the current state of the device as stage 1. With the cursor on the “Save Stage 1” menu item (see Figure 108), pressing the RIGHT ARROW will display the saving stage 1 help screen (see Figure 109). Pressing the RIGHT ARROW button again will move past the help screen to the “Saving Stage 1” command (see Figure 110). Pressing the *Enter* button will save the current device state in stage 1. Pressing the LEFT ARROW will exit the saving stage 1 command. To exit the utilities menu, press the *Display* button. Once the device state is saved, the *Enter* button will need to be pressed again (see Figure 111). When a stage is saved, it is automatically enabled. An enabled stage is available for selection using the stage change button. The Disable/Enable Stage menu can be used to enable and disable the stage.

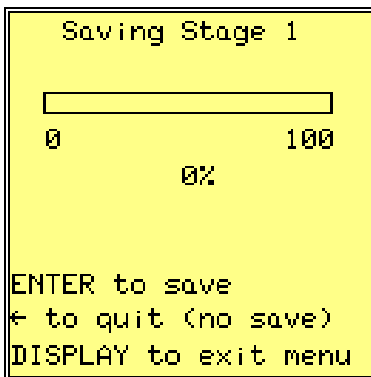


Figure 110

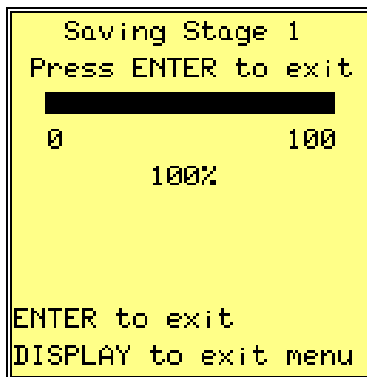


Figure 111

SAVE STAGE 2

The save stage 2 command can be used to save the current state of the device as stage 2. With the cursor on the “Save Stage 2” menu item (see Figure 112), pressing the RIGHT ARROW will display the saving stage 2 help screen (see Figure 113). Pressing the RIGHT ARROW button again will move past the help screen to the “Saving Stage 2” command (see Figure 114). Pressing the *Enter* button will save the current device state in stage 2. Pressing the LEFT ARROW will exit the saving stage 2 command. To exit the utilities menu, press the *Display* button. Once the device state is saved, the *Enter* button will need to be pressed again. When a stage is saved, it is automatically enabled. An enabled stage is available for selection using the stage change button. The Disable/Enable Stage menu can be used to enable and disable the stage.

SELECT USER

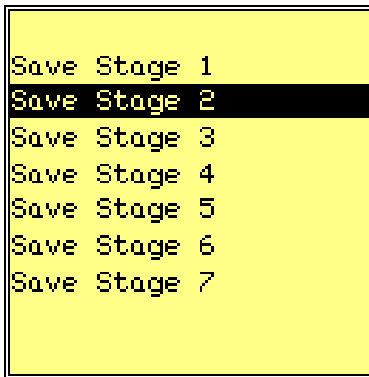


Figure 112

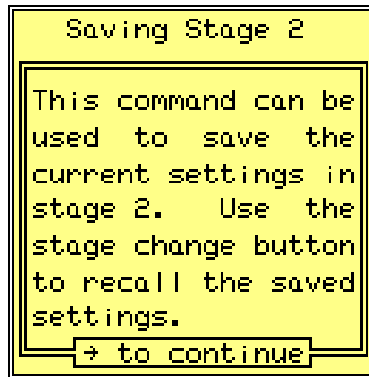


Figure 113

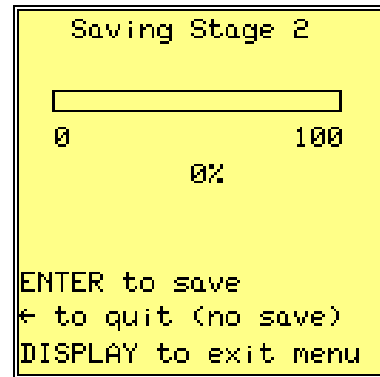


Figure 114

SAVE STAGE 3

The save stage 3 command can be used to save the current state of the device as stage 3. With the cursor on the "Save Stage 3" menu item (see Figure 115), pressing the RIGHT ARROW will display the saving stage 3 help screen (see Figure 116). Pressing the RIGHT ARROW button again will move past the help screen to the "Saving Stage 3" command (see Figure 117). Pressing the *Enter* button will save the current device state in stage 3. Pressing the LEFT ARROW will exit the saving stage 3 command. To exit the utilities menu, press the *Display* button. Once the device state is saved, the *Enter* button will need to be pressed again. When a stage is saved, it is automatically enabled. An enabled stage is available for selection using the stage change button. The Disable/Enable Stage menu can be used to enable and disable the stage.

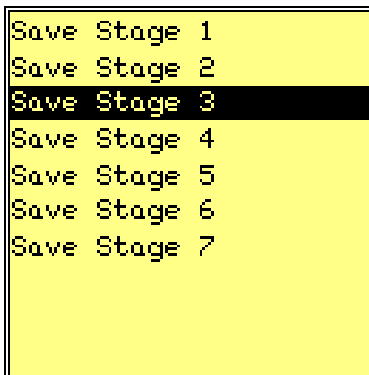


Figure 115

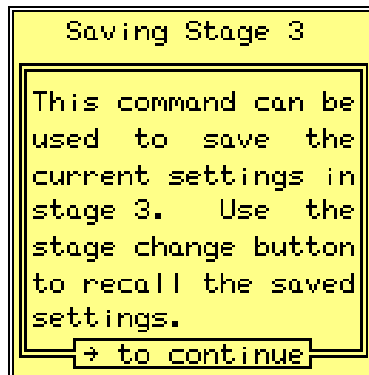


Figure 116

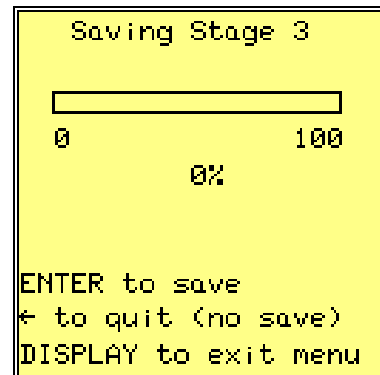


Figure 117

SELECT USER

SAVE STAGE 4

The save stage 4 command can be used to save the current state of the device as stage 4. With the cursor on the “Save Stage 4” menu item (see Figure 118), pressing the RIGHT ARROW will display the saving stage 4 help screen (see Figure 119). Pressing the RIGHT ARROW button again will move past the help screen to the “Saving Stage 4” command (see Figure 120). Pressing the *Enter* button will save the current device state in stage 4. Pressing the LEFT ARROW will exit the saving stage 4 command. To exit the utilities menu, press the *Display* button. Once the device state is saved, the *Enter* button will need to be pressed again. When a stage is saved, it is automatically enabled. An enabled stage is available for selection using the stage change button. The Disable/Enable Stage menu can be used to enable and disable the stage.

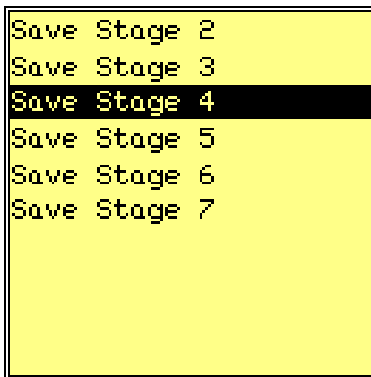


Figure 118

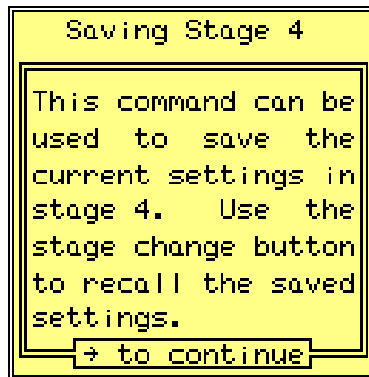


Figure 119

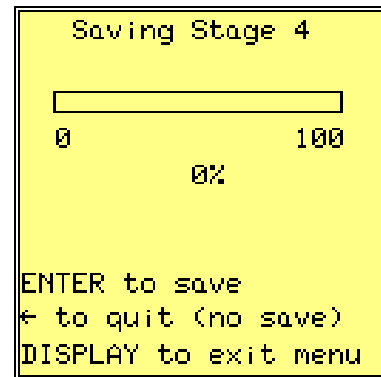


Figure 120

SAVE STAGE 5

The save stage 5 command can be used to save the current state of the device as stage 5. With the cursor on the “Save Stage 5” menu item (see Figure 121), pressing the RIGHT ARROW will display the saving stage 5 help screen (see Figure 122). Pressing the RIGHT ARROW button again will move past the help screen to the “Saving Stage 5” command (see Figure 123). Pressing the *Enter* button will save the current device state in stage 5. Pressing the LEFT ARROW will exit the saving stage 5 command. To exit the utilities menu, press the *Display* button. Once the device state is saved, the *Enter* button will need to be pressed again. When a stage is saved, it is automatically enabled. An enabled stage is available for selection using the stage change button. The Disable/Enable Stage menu can be used to enable and disable the stage.

SELECT USER

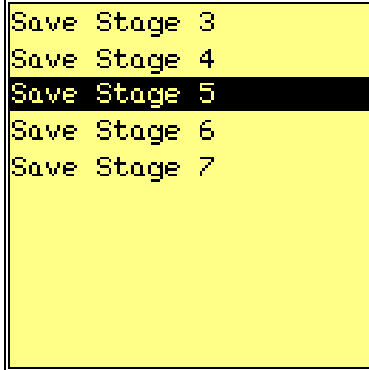


Figure 121

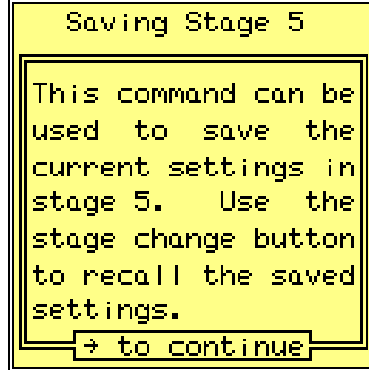


Figure 122

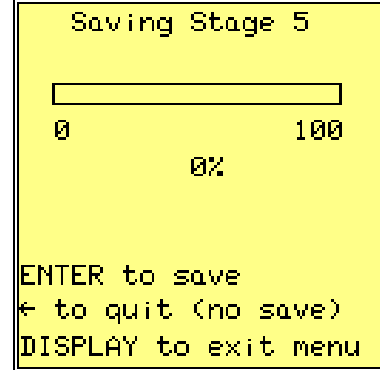


Figure 123

SAVE STAGE 6

The save stage 6 command can be used to save the current state of the device as stage 6. With the cursor on the "Save Stage 6" menu item (see Figure 124), pressing the RIGHT ARROW will display the saving stage 6 help screen (see Figure 125). Pressing the RIGHT ARROW button again will move past the help screen to the "Saving Stage 6" command (see Figure 126). Pressing the *Enter* button will save the current device state in stage 6. Pressing the LEFT ARROW will exit the saving stage 6 command. To exit the utilities menu, press the *Display* button. Once the device state is saved, the *Enter* button will need to be pressed again. When a stage is saved, it is automatically enabled. An enabled stage is available for selection using the stage change button. The Disable/Enable Stage menu can be used to enable and disable the stage.

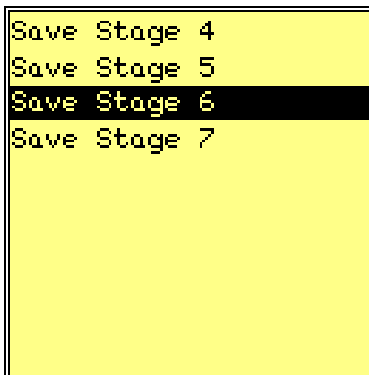


Figure 124

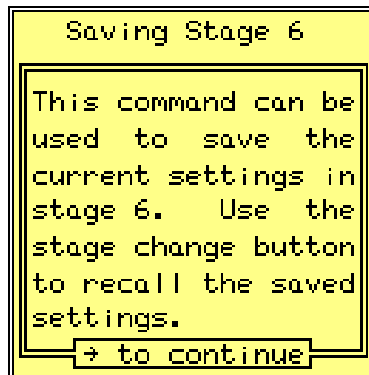


Figure 125

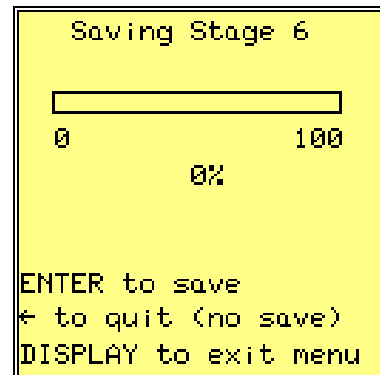


Figure 126

SELECT USER

SAVE STAGE 7

The save stage 7 command can be used to save the current state of the device as stage 7. With the cursor on the “Save Stage 7” menu item (see Figure 127), pressing the RIGHT ARROW will display the saving stage 7 help screen (see Figure 128). Pressing the RIGHT ARROW button again will move past the help screen to the “Saving Stage 7” command (see Figure 129). Pressing the *Enter* button will save the current device state in stage 7. Pressing the LEFT ARROW will exit the saving stage 7 command. To exit the utilities menu, press the *Display* button. Once the device state is saved, the *Enter* button will need to be pressed again. When a stage is saved, it is automatically enabled. An enabled stage is available for selection using the stage change button. The Disable/Enable Stage menu can be used to enable and disable the stage.

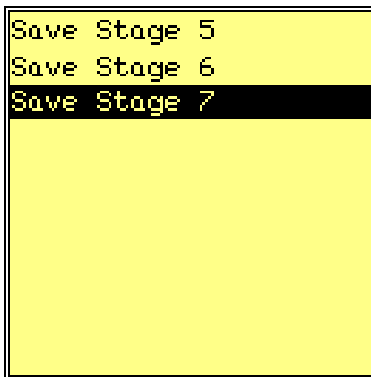


Figure 127

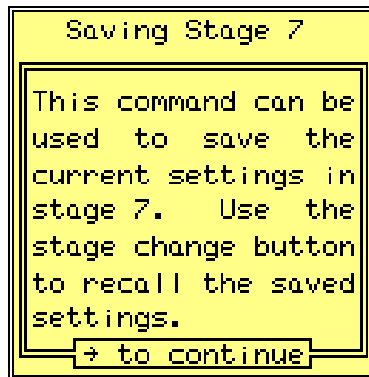


Figure 128

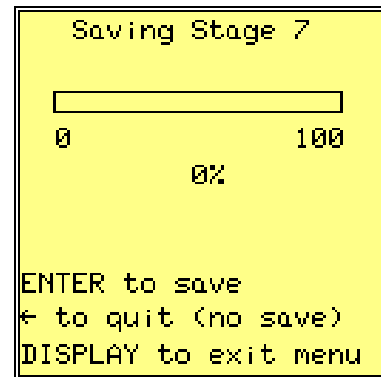


Figure 129

DISABLE/ENABLE STAGE

This disable/enable stage menu has items used to disable or restore stages used by the stage change button. With the cursor on the “Disable/Enable Stage” menu item (see Figure 130), pressing the RIGHT ARROW will display the disable/enable stage help screen (see Figure 131). This help screen indicates that a toggle entry is present in the disable/enable stage menu list. A menu item that ends with the double arrow symbol will toggle between two values when the *Enter* button is pressed. Pressing the RIGHT ARROW button again will move past the help screen to the disable/enable stage menu (see Figure 132). At the top of the display, the text DISABLE/ENABLE STAGE indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position. To exit the utilities menu, press the *Display* button.

SELECT USER

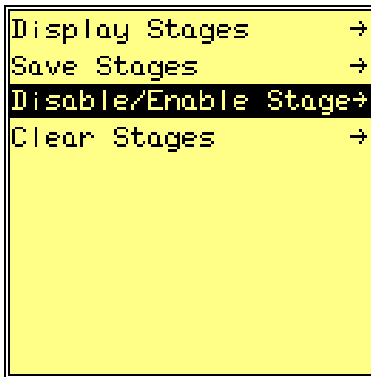


Figure 130

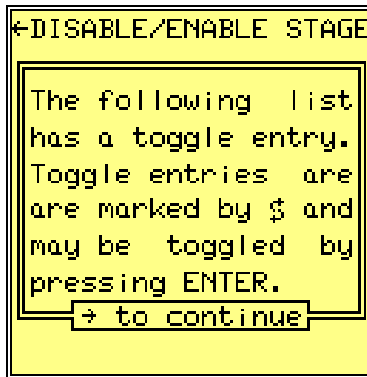


Figure 131

STAGE 1 IS DISABLED/STAGE 1 IS ENABLED

This menu item can be used to disable or restore stage 1. With the cursor on the "Stage 1 Is Enabled" menu item (see Figure 132), pressing the *Enter* button will change the menu item to "Stage 1 Is Disabled". Likewise, with the cursor on the "Stage 1 Is Disabled" menu item (see Figure 133), pressing the *Enter* button will change the menu item to "Stage 1 Is Enabled". This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. When a stage is enabled, it can be selected using the stage change button. If the stage is disabled it will not be available for selection using the stage change button. The Display Stage menu can be used to show the current status of a stage. The Save Stage menu can be used to change the stage. The factory default for stage 1 is undefined. When a stage is undefined, it can not be enabled using the Disable/Enable Stage menu. The Save Stage menu must be used to initially define a stage.

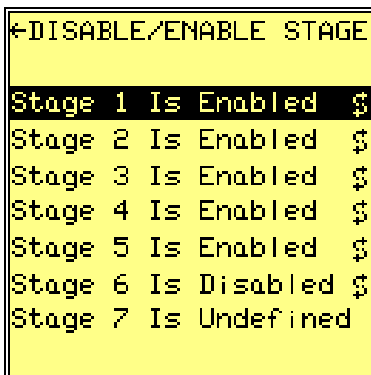


Figure 132

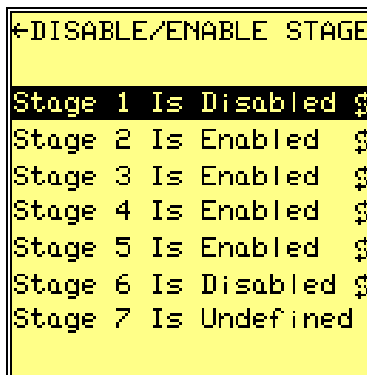
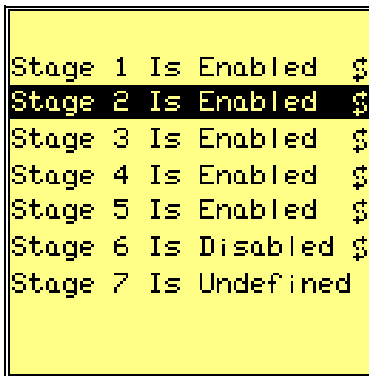


Figure 133

SELECT USER

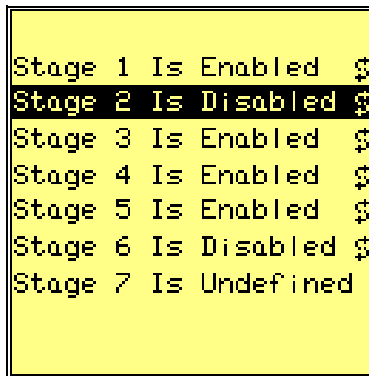
STAGE 2 IS DISABLED/STAGE 2 IS ENABLED

This menu item can be used to disable or restore stage 2. With the cursor on the “Stage 2 Is Enabled” menu item (see Figure 134), pressing the *Enter* button will change the menu item to “Stage 2 Is Disabled”. Likewise, with the cursor on the “Stage 2 Is Disabled” menu item (see Figure 135), pressing the *Enter* button will change the menu item to “Stage 2 Is Enabled”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. When a stage is enabled, it can be selected using the stage change button. If the stage is disabled it will not be available for selection using the stage change button. The Display Stage menu can be used to show the current status of a stage. The Save Stage menu can be used to change the stage. The factory default for stage 2 is undefined. When a stage is undefined, it can not be enabled using the Disable/Enable Stage menu. The Save Stage menu must be used to initially define a stage.



Stage 1 Is Enabled	\$
Stage 2 Is Enabled	\$
Stage 3 Is Enabled	\$
Stage 4 Is Enabled	\$
Stage 5 Is Enabled	\$
Stage 6 Is Disabled	\$
Stage 7 Is Undefined	

Figure 134



Stage 1 Is Enabled	\$
Stage 2 Is Disabled	\$
Stage 3 Is Enabled	\$
Stage 4 Is Enabled	\$
Stage 5 Is Enabled	\$
Stage 6 Is Disabled	\$
Stage 7 Is Undefined	

Figure 135

STAGE 3 IS DISABLED/STAGE 3 IS ENABLED

This menu item can be used to disable or restore stage 3. With the cursor on the “Stage 3 Is Enabled” menu item (see Figure 136), pressing the *Enter* button will change the menu item to “Stage 3 Is Disabled”. Likewise, with the cursor on the “Stage 3 Is Disabled” menu item (see Figure 137), pressing the *Enter* button will change the menu item to “Stage 3 Is Enabled”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. When a stage is enabled, it can be selected using the stage change button. If the stage is disabled it will not be available for selection using the stage change button. The Display Stage menu can be used to show the current status of a stage. The Save Stage menu can be used to change the stage. The factory default for stage 3 is undefined. When a stage is undefined, it can not be enabled using the Disable/Enable Stage menu. The Save Stage menu must be used to initially define a stage.

SELECT USER

```
Stage 1 Is Enabled $  
Stage 2 Is Enabled $  
Stage 3 Is Enabled $  
Stage 4 Is Enabled $  
Stage 5 Is Enabled $  
Stage 6 Is Disabled $  
Stage 7 Is Undefined
```

Figure 136

```
Stage 1 Is Enabled $  
Stage 2 Is Enabled $  
Stage 3 Is Disabled $  
Stage 4 Is Enabled $  
Stage 5 Is Enabled $  
Stage 6 Is Disabled $  
Stage 7 Is Undefined
```

Figure 137

STAGE 4 IS DISABLED/STAGE 4 IS ENABLED

This menu item can be used to disable or restore stage 4. With the cursor on the "Stage 4 Is Enabled" menu item (see Figure 138), pressing the *Enter* button will change the menu item to "Stage 4 Is Disabled". Likewise, with the cursor on the "Stage 4 Is Disabled" menu item (see Figure 139), pressing the *Enter* button will change the menu item to "Stage 4 Is Enabled". This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. When a stage is enabled, it can be selected using the stage change button. If the stage is disabled it will not be available for selection using the stage change button. The Display Stage menu can be used to show the current status of a stage. The Save Stage menu can be used to change the stage. The factory default for stage 4 is undefined. When a stage is undefined, it can not be enabled using the Disable/Enable Stage menu. The Save Stage menu must be used to initially define a stage.

```
Stage 2 Is Enabled $  
Stage 3 Is Enabled $  
Stage 4 Is Enabled $  
Stage 5 Is Enabled $  
Stage 6 Is Disabled $  
Stage 7 Is Undefined
```

Figure 138

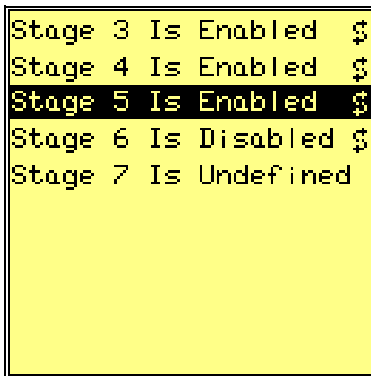
```
Stage 2 Is Enabled $  
Stage 3 Is Enabled $  
Stage 4 Is Disabled $  
Stage 5 Is Enabled $  
Stage 6 Is Disabled $  
Stage 7 Is Undefined
```

Figure 139

SELECT USER

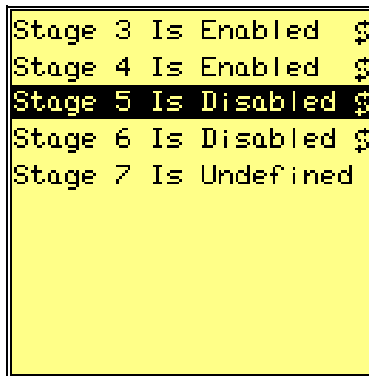
STAGE 5 IS DISABLED/STAGE 5 IS ENABLED

This menu item can be used to disable or restore stage 5. With the cursor on the “Stage 5 Is Enabled” menu item (see Figure 140), pressing the *Enter* button will change the menu item to “Stage 5 Is Disabled”. Likewise, with the cursor on the “Stage 5 Is Disabled” menu item (see Figure 141), pressing the *Enter* button will change the menu item to “Stage 5 Is Enabled”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. When a stage is enabled, it can be selected using the stage change button. If the stage is disabled it will not be available for selection using the stage change button. The Display Stage menu can be used to show the current status of a stage. The Save Stage menu can be used to change the stage. The factory default for stage 5 is undefined. When a stage is undefined, it can not be enabled using the Disable/Enable Stage menu. The Save Stage menu must be used to initially define a stage.



```
Stage 3 Is Enabled $
Stage 4 Is Enabled $
Stage 5 Is Enabled $
Stage 6 Is Disabled $
Stage 7 Is Undefined
```

Figure 140



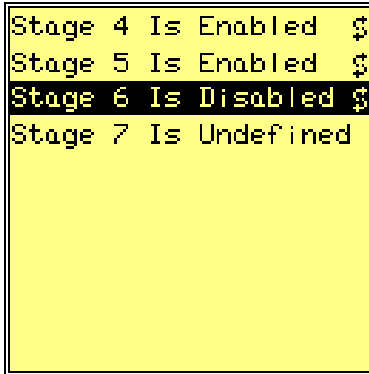
```
Stage 3 Is Enabled $
Stage 4 Is Enabled $
Stage 5 Is Disabled $
Stage 6 Is Disabled $
Stage 7 Is Undefined
```

Figure 141

STAGE 6 IS DISABLED/STAGE 6 IS ENABLED

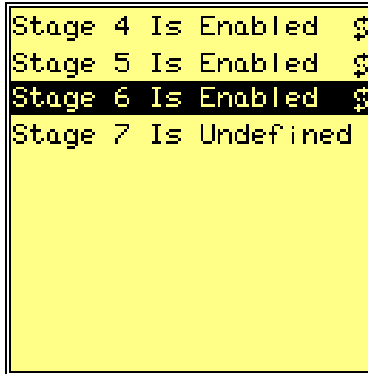
This menu item can be used to disable or restore stage 6. With the cursor on the “Stage 6 Is Disabled” menu item (see Figure 142), pressing the *Enter* button will change the menu item to “Stage 6 Is Enabled”. Likewise, with the cursor on the “Stage 6 Is Enabled” menu item (see Figure 143), pressing the *Enter* button will change the menu item to “Stage 6 Is Disabled”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. When a stage is enabled, it can be selected using the stage change button. If the stage is disabled it will not be available for selection using the stage change button. The Display Stage menu can be used to show the current status of a stage. The Save Stage menu can be used to change the stage. The factory default for stage 6 is undefined. When a stage is undefined, it can not be enabled using the Disable/Enable Stage menu. The Save Stage menu must be used to initially define a stage.

SELECT USER



```
Stage 4 Is Enabled $
Stage 5 Is Enabled $
Stage 6 Is Disabled $
Stage 7 Is Undefined
```

Figure 142

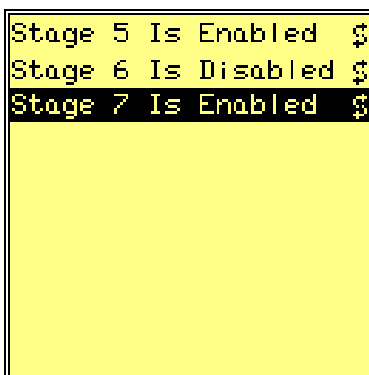


```
Stage 4 Is Enabled $
Stage 5 Is Enabled $
Stage 6 Is Enabled $
Stage 7 Is Undefined
```

Figure 143

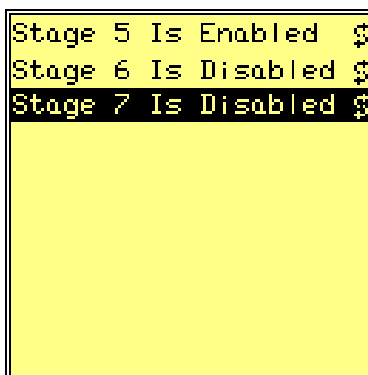
STAGE 7 IS DISABLED/STAGE 7 IS ENABLED

This menu item can be used to disable or restore stage 7. With the cursor on the “Stage 7 Is Enabled” menu item (see Figure 144), pressing the *Enter* button will change the menu item to “Stage 7 Is Disabled”. Likewise, with the cursor on the “Stage 7 Is Disabled” menu item (see Figure 145), pressing the *Enter* button will change the menu item to “Stage 7 Is Enabled”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. When a stage is enabled, it can be selected using the stage change button. If the stage is disabled it will not be available for selection using the stage change button. The Display Stage menu can be used to show the current status of a stage. The Save Stage menu can be used to change the stage. The factory default for stage 7 is undefined. When a stage is undefined, it can not be enabled using the Disable/Enable Stage menu. The Save Stage menu must be used to initially define a stage.



```
Stage 5 Is Enabled $
Stage 6 Is Disabled $
Stage 7 Is Enabled $
```

Figure 144



```
Stage 5 Is Enabled $
Stage 6 Is Disabled $
Stage 7 Is Disabled $
```

Figure 145

SELECT USER

CLEAR STAGES

The clear stages menu has items used to clear the stages for the active user. With the cursor on the “Clear Stages” menu item (see Figure 146), pressing the RIGHT ARROW button will display the clear stages menu list (see Figure 147). At the top of the display, the text CLEAR STAGES indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position. To exit the utilities menu, press the *Display* button.

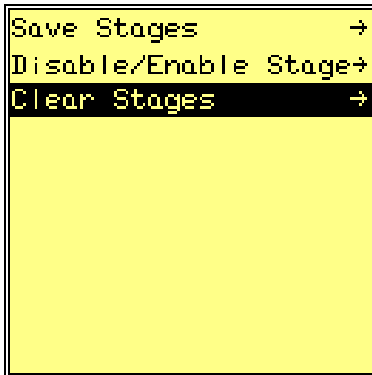


Figure 146

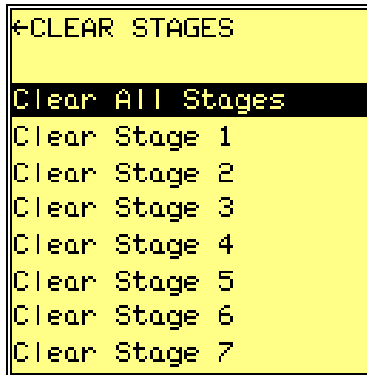


Figure 147

CLEAR ALL STAGES

The clear all stages command can be used to clear all of the stages for the active user. With the cursor on the “Clear All Stages” menu item (see Figure 147), pressing the RIGHT ARROW will display the clear all stages help screen (see Figure 148). Pressing the RIGHT ARROW button again will move past the help screen to the “Clear All Stages” command (see Figure 149). Pressing the *Enter* button will clear all stages. Pressing the LEFT ARROW will exit the clear all stages command. To exit the utilities menu, press the *Display* button. Once the stages are cleared, the *Enter* button will need to be pressed again. When the stages are cleared, they are automatically disabled. The Save Stages menu can be used to enable stages.

SELECT USER

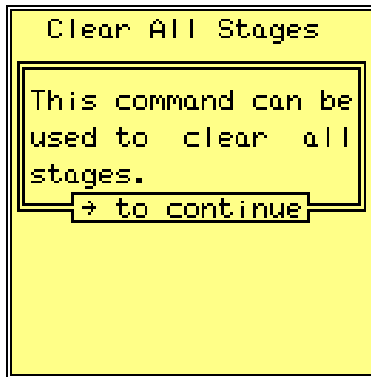


Figure 148

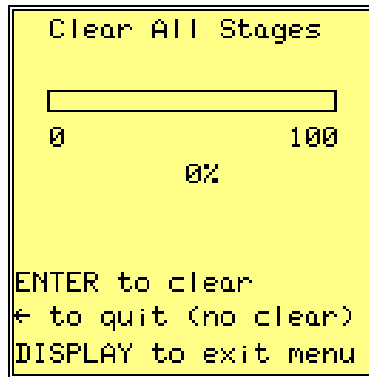


Figure 149

CLEAR STAGE 1

The clear stage 1 command can be used to clear stage 1 of the active user. With the cursor on the "Clear Stage 1" menu item (see Figure 150), pressing the RIGHT ARROW will display the clear stage 1 help screen (see Figure 151). Pressing the RIGHT ARROW button again will move past the help screen to the "Clear Stage 1" command (see Figure 152). Pressing the *Enter* button will clear stage 1. Pressing the LEFT ARROW will exit the clear stage 1 command. To exit the utilities menu, press the *Display* button. Once the stage is cleared, the *Enter* button will need to be pressed again. When a stage is cleared, it is automatically disabled. The Save Stages menu can be used to enable the stage.

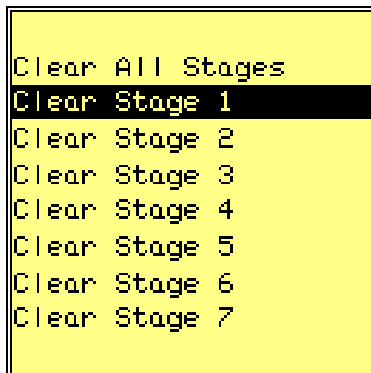


Figure 150

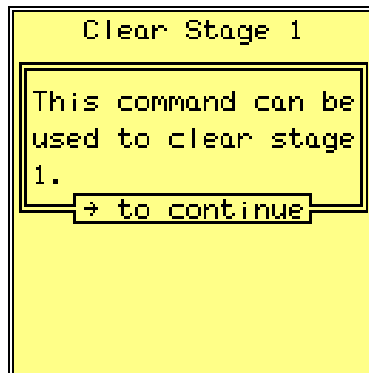


Figure 151

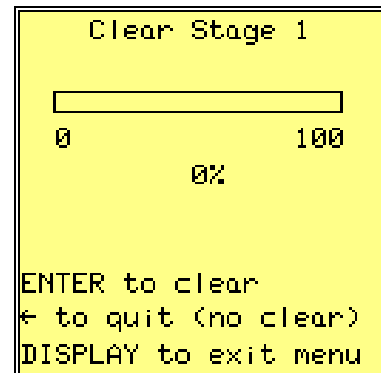


Figure 152

SELECT USER

CLEAR STAGE 2

The clear stage 2 command can be used to clear stage 2 of the active user. With the cursor on the “Clear Stage 2” menu item (see Figure 153), pressing the RIGHT ARROW will display the clear stage 2 help screen (see Figure 154). Pressing the RIGHT ARROW button again will move past the help screen to the “Clear Stage 2” command (see Figure 155). Pressing the *Enter* button will clear stage 2. Pressing the LEFT ARROW will exit the clear stage 2 command. To exit the utilities menu, press the *Display* button. Once the stage is cleared, the *Enter* button will need to be pressed again. When a stage is cleared, it is automatically disabled. The Save Stages menu can be used to enable the stage.

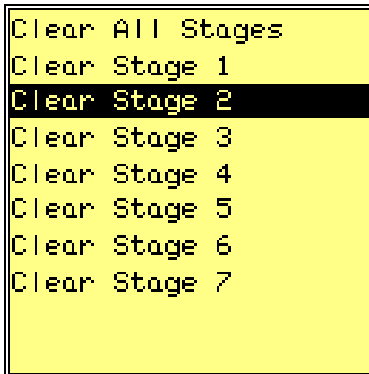


Figure 153

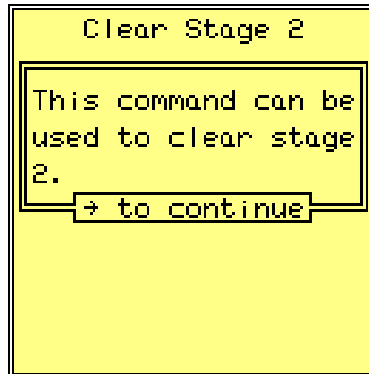


Figure 154

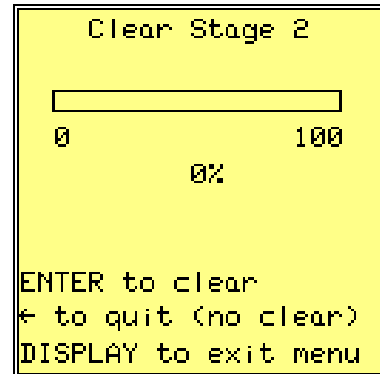
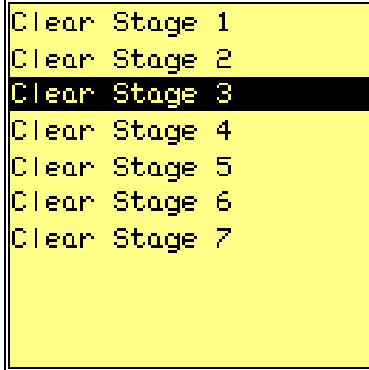


Figure 155

CLEAR STAGE 3

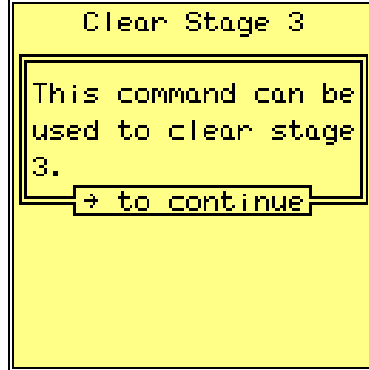
The clear stage 3 command can be used to clear stage 3 of the active user. With the cursor on the “Clear Stage 3” menu item (see Figure 156), pressing the RIGHT ARROW will display the clear stage 3 help screen (see Figure 157). Pressing the RIGHT ARROW button again will move past the help screen to the “Clear Stage 3” command (see Figure 158). Pressing the *Enter* button will clear stage 3. Pressing the LEFT ARROW will exit the clear stage 3 command. To exit the utilities menu, press the *Display* button. Once the stage is cleared, the *Enter* button will need to be pressed again. When a stage is cleared, it is automatically disabled. The Save Stages menu can be used to enable the stage.

SELECT USER



```
Clear Stage 1
Clear Stage 2
Clear Stage 3
Clear Stage 4
Clear Stage 5
Clear Stage 6
Clear Stage 7
```

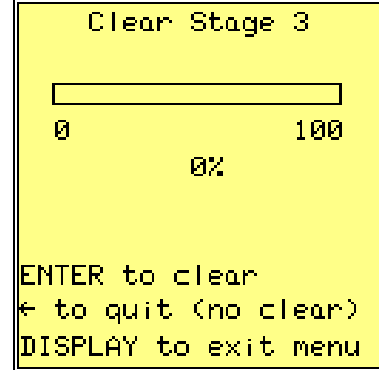
Figure 156



```
Clear Stage 3

This command can be
used to clear stage
3.
→ to continue
```

Figure 157



```
Clear Stage 3

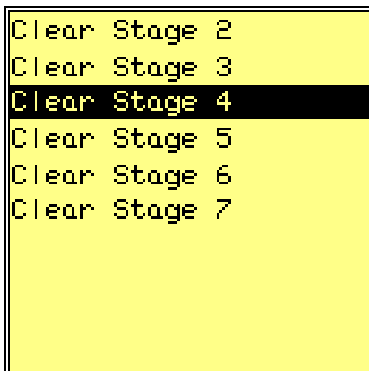
0 100
0%

ENTER to clear
← to quit (no clear)
DISPLAY to exit menu
```

Figure 158

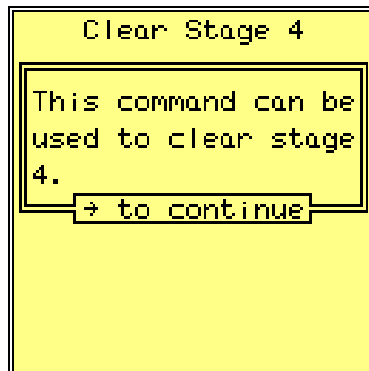
CLEAR STAGE 4

The clear stage 4 command can be used to clear stage 4 of the active user. With the cursor on the “Clear Stage 4” menu item (see Figure 159), pressing the RIGHT ARROW will display the clear stage 4 help screen (see Figure 160). Pressing the RIGHT ARROW button again will move past the help screen to the “Clear Stage 4” command (see Figure 161). Pressing the *Enter* button will clear stage 4. Pressing the LEFT ARROW will exit the clear stage 4 command. To exit the utilities menu, press the *Display* button. Once the stage is cleared, the *Enter* button will need to be pressed again. When a stage is cleared, it is automatically disabled. The Save Stages menu can be used to enable the stage.



```
Clear Stage 2
Clear Stage 3
Clear Stage 4
Clear Stage 5
Clear Stage 6
Clear Stage 7
```

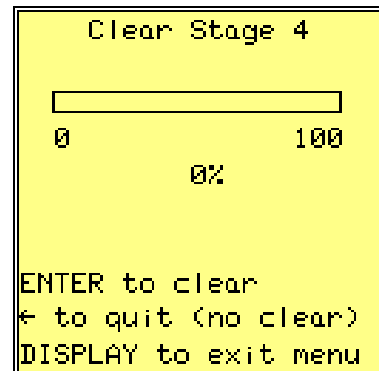
Figure 159



```
Clear Stage 4

This command can be
used to clear stage
4.
→ to continue
```

Figure 160



```
Clear Stage 4

0 100
0%

ENTER to clear
← to quit (no clear)
DISPLAY to exit menu
```

Figure 161

SELECT USER

CLEAR STAGE 5

The clear stage 5 command can be used to clear stage 5 of the active user. With the cursor on the “Clear Stage 5” menu item (see Figure 162), pressing the RIGHT ARROW will display the clear stage 5 help screen (see Figure 163). Pressing the RIGHT ARROW button again will move past the help screen to the “Clear Stage 5” command (see Figure 164). Pressing the *Enter* button will clear stage 5. Pressing the LEFT ARROW will exit the clear stage 5 command. To exit the utilities menu, press the *Display* button. Once the stage is cleared, the *Enter* button will need to be pressed again. When a stage is cleared, it is automatically disabled. The Save Stages menu can be used to enable the stage.

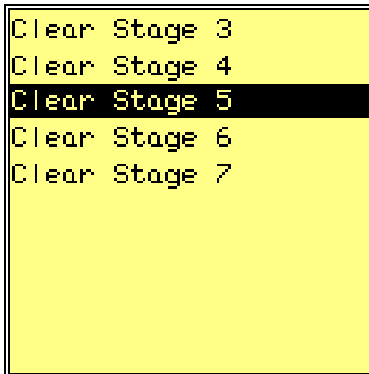


Figure 162

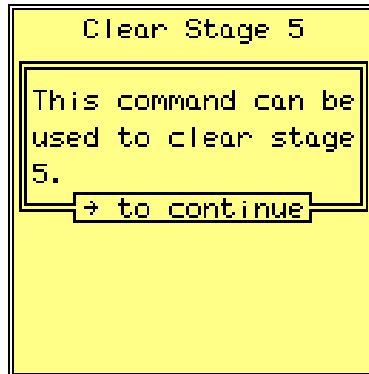


Figure 163

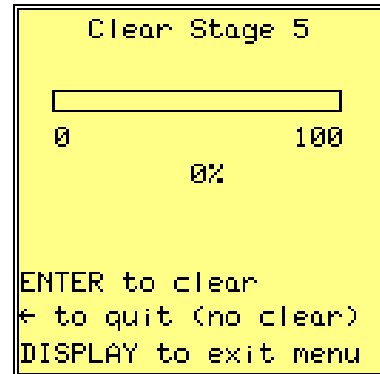


Figure 164

CLEAR STAGE 6

The clear stage 6 command can be used to clear stage 6 of the active user. With the cursor on the “Clear Stage 6” menu item (see Figure 165), pressing the RIGHT ARROW will display the clear stage 6 help screen (see Figure 166). Pressing the RIGHT ARROW button again will move past the help screen to the “Clear Stage 6” command (see Figure 167). Pressing the *Enter* button will clear stage 6. Pressing the LEFT ARROW will exit the clear stage 6 command. To exit the utilities menu, press the *Display* button. Once the stage is cleared, the *Enter* button will need to be pressed again. When a stage is cleared, it is automatically disabled. The Save Stages menu can be used to enable the stage.

SELECT USER

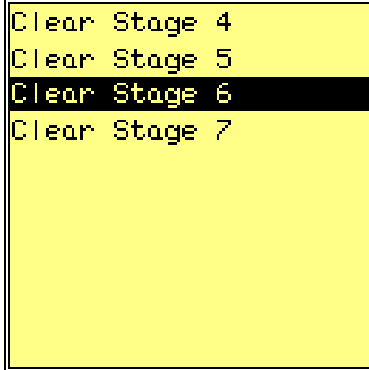


Figure 165

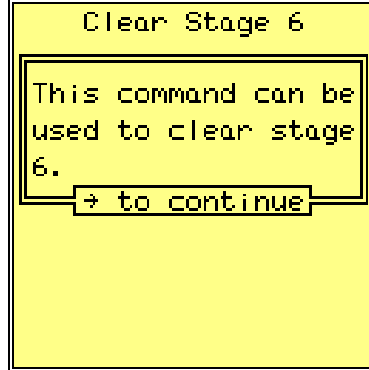


Figure 166

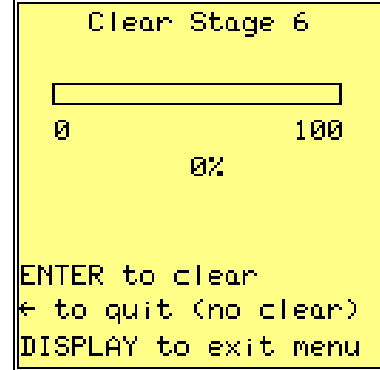


Figure 167

CLEAR STAGE 7

The clear stage 7 command can be used to clear stage 7 of the active user. With the cursor on the “Clear Stage 7” menu item (see Figure 168), pressing the RIGHT ARROW will display the clear stage 7 help screen (see Figure 169). Pressing the RIGHT ARROW button again will move past the help screen to the “Clear Stage 7” command (see Figure 170). Pressing the *Enter* button will clear stage 7. Pressing the LEFT ARROW will exit the clear stage 7 command. To exit the utilities menu, press the *Display* button. Once the stage is cleared, the *Enter* button will need to be pressed again. When a stage is cleared, it is automatically disabled. The Save Stages menu can be used to enable the stage.

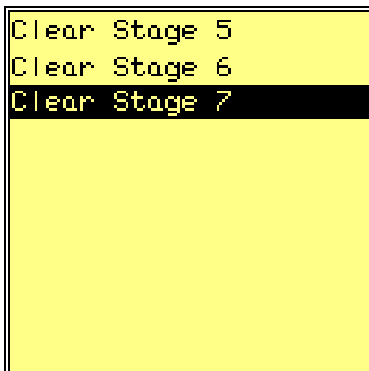


Figure 168

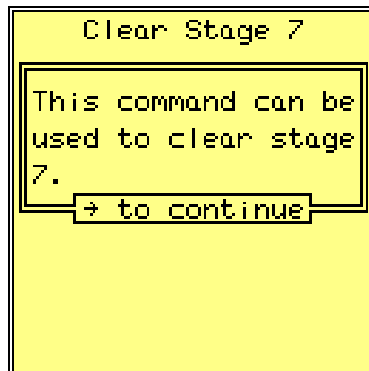


Figure 169

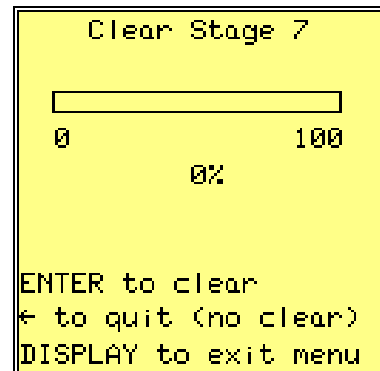


Figure 170

SELECT USER

LOAD FACTORY DEFAULTS (for entire active area)

The load factory defaults command will load the factory defaults for the entire active configuration area. With the cursor on the “Load Factory Defaults” menu item (see Figure 171), pressing the RIGHT ARROW will display the loading user defaults help screen (see Figure 172). Pressing the RIGHT ARROW button again will move past the help screen to the “Loading User Defaults” command (see Figure 174). Pressing the LEFT ARROW will terminate the loading user defaults command. Pressing the *Enter* button will load the factory defaults for the entire active area. Note that the effect on active surgical functions is immediate. Once the defaults are loaded (see Figure 175), the *Enter* button will need to be pressed again. To exit the utilities menu, press the *Display* button. If the load user defaults command is selected while any surgical functions are active, a warning screen will appear (see Figure 173) and a warning tone will sound.

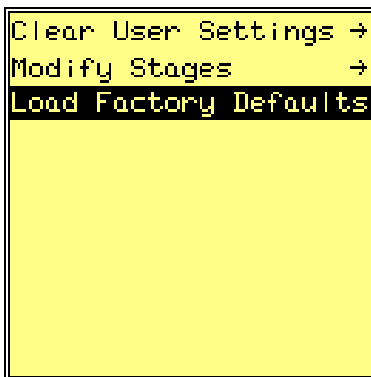


Figure 171

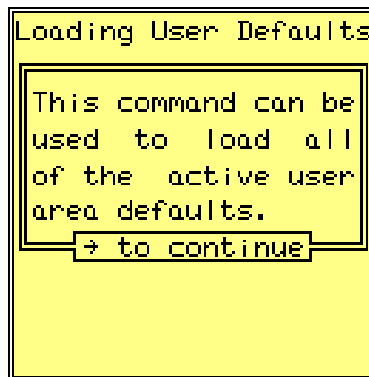


Figure 172

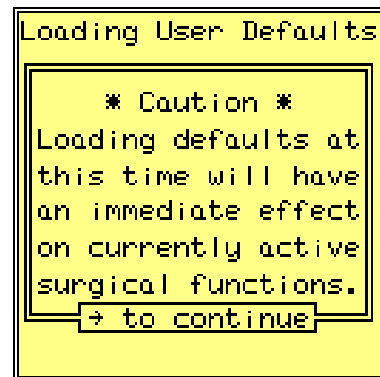


Figure 173

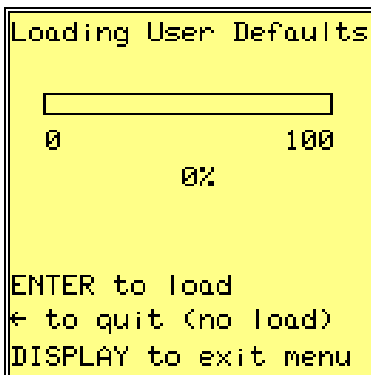


Figure 174

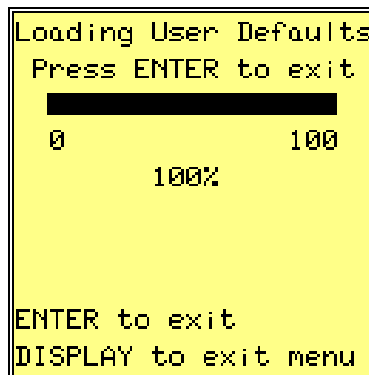


Figure 175

CURRENT SETTINGS

CURRENT SETTINGS

The current settings menu has items used to control the surgical functions. With the cursor on the “Current Settings” menu item (see Figure 176), pressing the RIGHT ARROW button will display the current settings menu list (see Figure 177). At the top of the display, the text CURRENT SETTINGS indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position. The menu items found in the “Current Settings” menu are items that have a direct effect on the surgical functions. Modifying these parameters while an associated surgical function is enabled will have an immediate effect. Changes made in the current settings menu are saved in the active configuration. To exit the utilities menu, press the *Display* button.

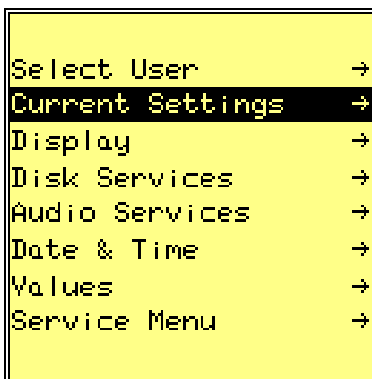


Figure 176

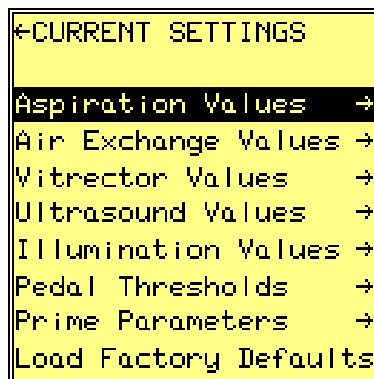


Figure 177

ASPIRATION VALUES

This aspiration values menu has items used to control the aspiration surgical function. With the cursor on the “Aspiration Values” menu item (see Figure 177), pressing the RIGHT ARROW will display the aspiration values help screen (see Figure 178). This help screen indicates that a toggle entry is present in the aspiration values menu list. A menu item that ends with the double arrow symbol will toggle between two values when the *Enter* button is pressed. Pressing the RIGHT ARROW button again will move past the help screen to the aspiration values menu (see Figure 179). At the top of the display, the text ASPIRATION VALUES indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position. To exit the utilities menu, press the *Display* button.

CURRENT SETTINGS



Figure 178

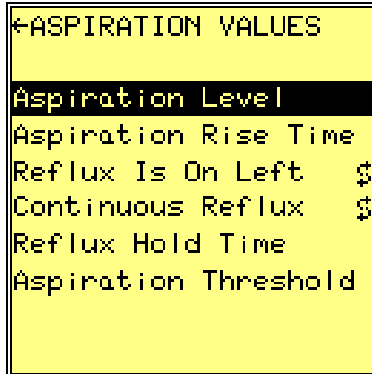


Figure 179

ASPIRATION LEVEL

The aspiration level command can be used to adjust the maximum aspiration level. With the cursor on the “Aspiration Level” menu item (see Figure 179), pressing the RIGHT ARROW will display the aspiration level help screen (see Figure 180). Pressing the RIGHT ARROW button again will move past the help screen to the “Aspiration Level” command (see Figure 181). The UP ARROW and DOWN ARROW buttons are used to increase and decrease the maximum aspiration level. Changing this value will have an immediate effect on the Aspiration surgical function, if it is enabled. Likewise, if the surgical function is enabled, changing the aspiration level using the Aspiration UP and DOWN buttons will cause the displayed value to change. Pressing the *Enter* button will save the displayed value in the active configuration and exit the aspiration level command. Pressing the LEFT ARROW will discard any changes made and restore the aspiration level to its previous value. To exit the utilities menu, press the *Display* button. The factory default value for the aspiration level is 250 mmHg.

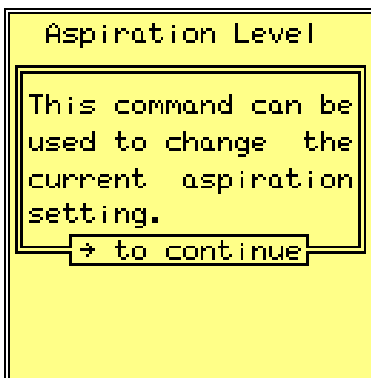


Figure 180

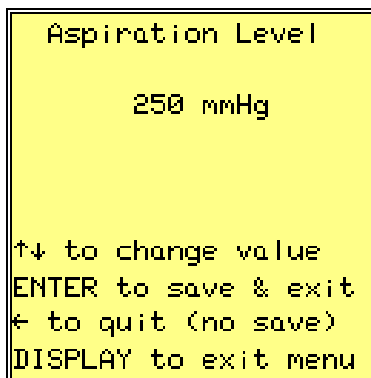


Figure 181

CURRENT SETTINGS

ASPIRATION RISE TIME

The aspiration time command can be used to set the aspiration rise time for fixed aspiration modes. With the cursor on the “Aspiration Rise Time” menu item (see Figure 182), pressing the RIGHT ARROW will display the aspiration rise time help screen (see Figure 183). Pressing the RIGHT ARROW button again will move past the help screen to the “Aspiration Rise Time” command (see Figure 184). The UP ARROW and DOWN ARROW buttons are used to increase and decrease the aspiration rise time. Pressing the *Enter* button will save the displayed value in the active configuration and exit the aspiration rise time command. Pressing the LEFT ARROW will discard any changes made and restore the aspiration rise time to its previous value. To exit the utilities menu, press the *Display* button.

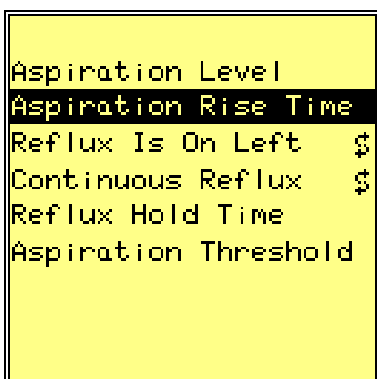


Figure 182

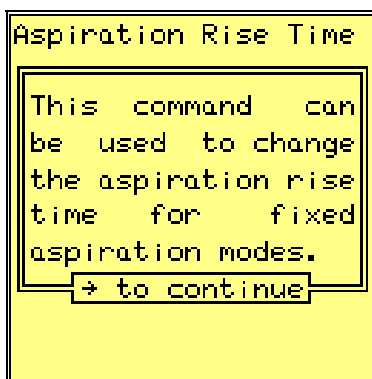


Figure 183

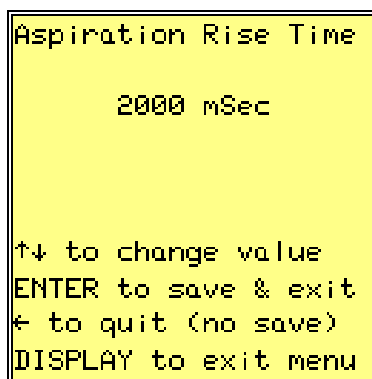


Figure 184

REFLUX IS ON LEFT/REFLUX IS ON RIGHT

This menu item can be used to select which foot pedal switch controls reflux. With the cursor on the “Reflux Is On Left” menu item (see Figure 185), pressing the *Enter* button will change the menu item to “Reflux Is On Right”. Likewise, with the cursor on the “Reflux Is On Right” menu item (see Figure 186), pressing the *Enter* button will change the menu item to “Reflux Is On Left”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. When reflux is on the left, rotating the foot pedal to the left will start reflux. When reflux is on the right, rotating the foot pedal to the right will start reflux. When selecting the reflux switch, the remaining switch is used to enable cutting on the ultrasound or vitrector. The factory default is reflux on left.

CURRENT SETTINGS

Aspiration Level
Aspiration Rise Time
Reflux Is On Left \$
Continuous Reflux \$
Reflux Hold Time
Aspiration Threshold

Figure 185

Aspiration Level
Aspiration Rise Time
Reflux Is On Right \$
Continuous Reflux \$
Reflux Hold Time
Aspiration Threshold

Figure 186

CONTINUOUS REFLUX/TIMED REFLUX MODE

This menu item can be used to select the reflux mode. With the cursor on the “Continuous Reflux” menu item (see Figure 187), pressing the *Enter* button will change the menu item to “Timed Reflux Mode”. Likewise, with the cursor on the “Timed Reflux Mode” menu item (see Figure 188), pressing the *Enter* button will change the menu item to “Continuous Reflux”. While in continuous reflux mode, the reflux valve will close when the foot pedal reflux switch is active. The reflux valve will open when the foot pedal reflux switch is inactive. While in timed reflux mode, the reflux valve will close for the time specified in the reflux hold time command, when activated by the foot pedal reflux switch. The foot pedal reflux switch must then be inactive before another reflux cycle can be generated. Note that the foot pedal must be in the rest position (up) before reflux will be generated. The factory default is timed continuous mode.

Aspiration Rise Time
Reflux Is On Left \$
Continuous Reflux \$
Reflux Hold Time
Aspiration Threshold

Figure 187

Aspiration Rise Time
Reflux Is On Left \$
Timed Reflux Mode \$
Reflux Hold Time
Aspiration Threshold

Figure 188

CURRENT SETTINGS

REFLUX HOLD TIME

The reflux hold time parameter controls the length of time the reflux valve will remain closed, while in timed reflux mode. With the cursor on the “Reflux Hold Time” menu item (see Figure 189), pressing the RIGHT ARROW will display the reflux hold time help screen (see Figure 190). Pressing the RIGHT ARROW button again will move past the help screen to the “Reflux Hold Time” command (see Figure 191). The UP ARROW and DOWN ARROW buttons are used to increase and decrease the reflux hold time. Pressing the *Enter* button will save the displayed value in the active configuration and exit the reflux hold time command. Pressing the LEFT ARROW will discard any changes made and restore the reflux hold time to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the reflux hold time is 250 milliseconds.

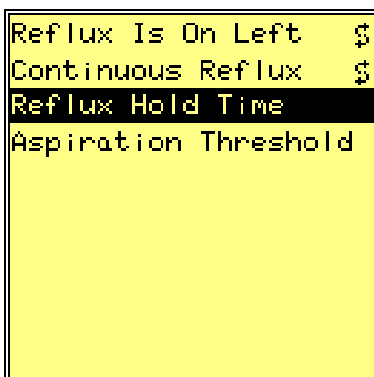


Figure 189

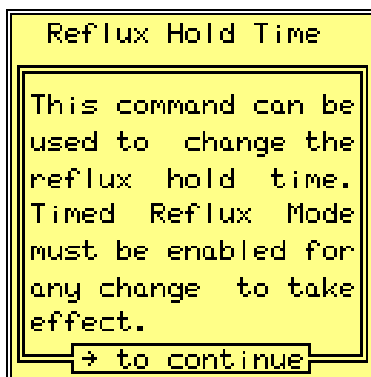


Figure 190

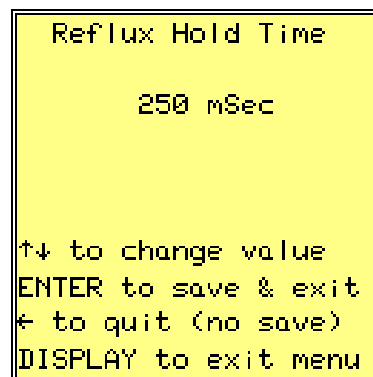


Figure 191

ASPIRATION THRESHOLD

The aspiration threshold parameter controls the level of aspiration present when the aspiration valve opens. With the cursor on the “Aspiration Threshold” menu item (see Figure 192), pressing the RIGHT ARROW will display the aspiration threshold help screen (see Figure 193). Pressing the RIGHT ARROW button again will move past the help screen to the “Aspiration Threshold” command (see Figure 194). The UP ARROW and DOWN ARROW buttons are used to increase and decrease the aspiration threshold. Pressing the *Enter* button will save the displayed value in the active configuration and exit the aspiration threshold command. Pressing the LEFT ARROW will discard any changes made and restore the aspiration threshold to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the aspiration threshold is 0 mmHg.

CURRENT SETTINGS

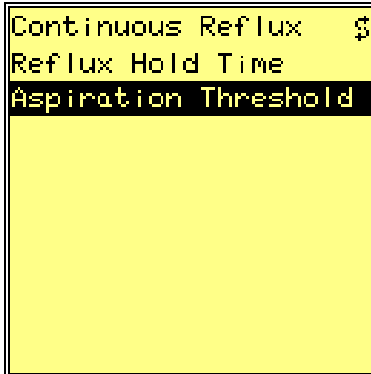


Figure 192

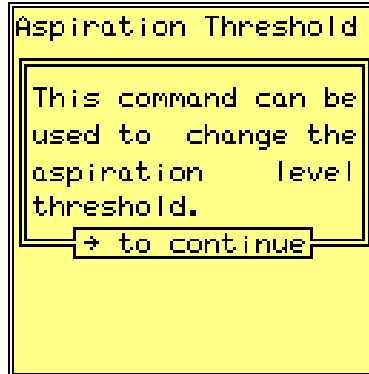


Figure 193

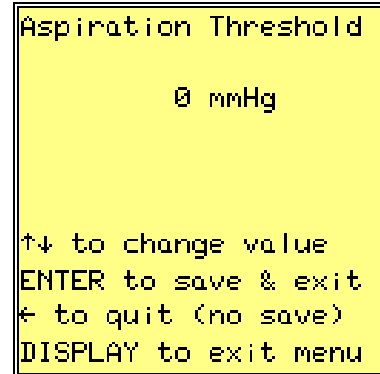


Figure 194

AIR EXCHANGE VALUES

The air exchange values menu has items used to control the air exchange surgical function. With the cursor on the “Air Exchange Values” menu item (see Figure 195), pressing the RIGHT ARROW will display the air exchange values menu (see Figure 196). At the top of the display, the text AIR EXCHANGE VALUES indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position. To exit the utilities menu, press the *Display* button.

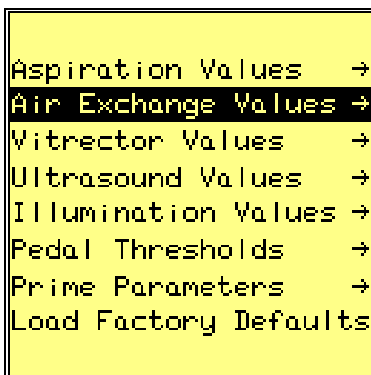


Figure 195

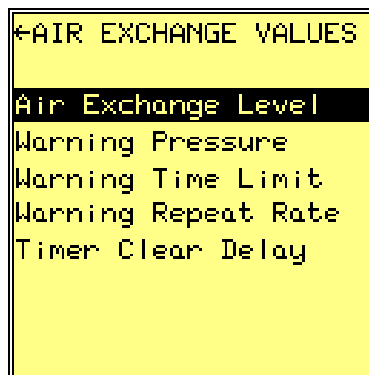


Figure 196

CURRENT SETTINGS

AIR EXCHANGE LEVEL

The air exchange level command can be used to adjust the air exchange pressure. With the cursor on the “Air Exchange Level” menu item (see Figure 196), pressing the RIGHT ARROW will display the air exchange level help screen (see Figure 197). Pressing the RIGHT ARROW button again will move past the help screen to the “Air Exchange Level” command (see Figure 198). The UP ARROW and DOWN ARROW buttons are used to increase and decrease the air exchange pressure. Changing this value will have an immediate effect on the Air Exchange surgical function, if it is enabled. Likewise, if the surgical function is enabled, changing the air exchange pressure using the Air Exchange UP and DOWN buttons will cause the displayed value to change. Pressing the *Enter* button will save the displayed value in the active configuration and exit the air exchange level command. Pressing the LEFT ARROW will discard any changes made and restore the air exchange pressure to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the air exchange level is 25 mmHg.

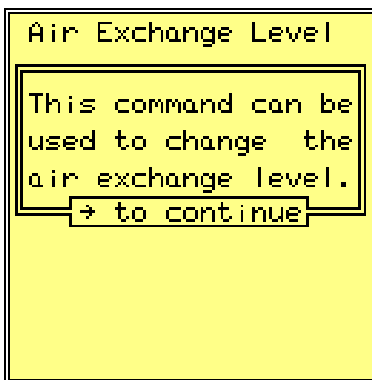


Figure 197

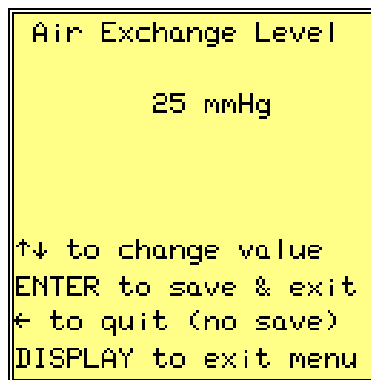


Figure 198

WARNING PRESSURE

The warning pressure command can be used to set the air exchange warning pressure. With the cursor on the “Warning Pressure” menu item (see Figure 199), pressing the RIGHT ARROW will display the warning pressure help screen (see Figure 200). Pressing the RIGHT ARROW button again will move past the help screen to the “Warning Pressure” command (see Figure 201). If the air exchange surgical function is on and the eye pressure exceeds this value, a warning tone and message are generated. Also, the duration of the over pressure condition is accumulated and displayed in the surgical function window. The UP ARROW and DOWN ARROW buttons are used to increase and decrease the warning pressure level. Pressing the *Enter* button will save the displayed value in the active configuration and exit the warning pressure adjust command. Pressing the LEFT ARROW will discard any changes made and

CURRENT SETTINGS

restore the warning pressure to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the air exchange warning pressure is 70 mmHg.

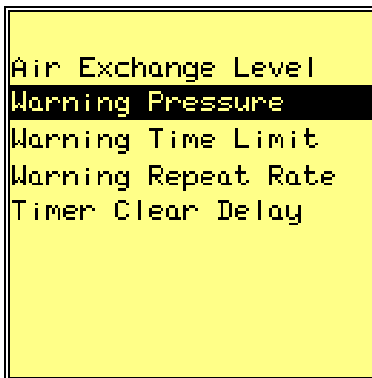


Figure 199

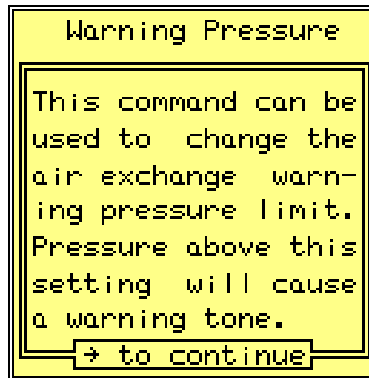


Figure 200

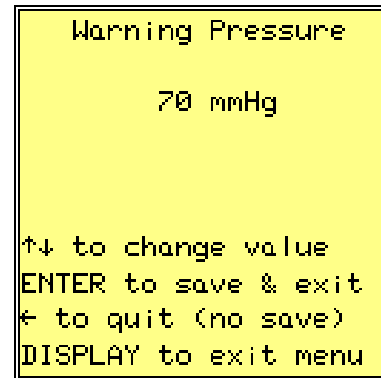


Figure 201

WARNING TIME LIMIT

The warning time limit command can be used to set the air exchange warning time limit. With the cursor on the “Warning Time Limit” menu item (see Figure 202), pressing the RIGHT ARROW will display the warning time limit help screen (see Figure 203). Pressing the RIGHT ARROW button again will move past the help screen to the “Warning Time Limit” command (see Figure 204). If the air exchange surgical function is on and the warning time exceeds this value, an error tone and message are generated. The duration of the over pressure condition is accumulated and displayed in the surgical function window. The UP ARROW and DOWN ARROW buttons are used to increase and decrease the warning time limit. Pressing the *Enter* button will save the displayed value in the active configuration and exit the warning time limit adjust command. Pressing the LEFT ARROW will discard any changes made and restore the warning time limit to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the air exchange warning time limit is 15 minutes. The maximum air exchange warning time limit is 29 minutes and 59 seconds.

CURRENT SETTINGS

```

Air Exchange Level
Warning Pressure
Warning Time Limit
Warning Repeat Rate
Timer Clear Delay
  
```

Figure 202

```

Warning Time Limit

This command can be
used to change the
air exchange time
limit. Excess pres-
sure longer than
this setting will
sound an alarm.

→ to continue
  
```

Figure 203

```

Warning Time Limit

15:00

→ move to next field
↑↓ to change value
ENTER to save & exit
← to quit (no save)
DISPLAY to exit menu
  
```

Figure 204

WARNING REPEAT RATE

The warning repeat rate command can be used to set the air exchange warning repeat rate. With the cursor on the “Warning Repeat Rate” menu item (see Figure 205), pressing the RIGHT ARROW will display the warning repeat rate help screen (see Figure 206). Pressing the RIGHT ARROW button again will move past the help screen to the “Warning Repeat Rate” command (see Figure 207). If the air exchange surgical function is on and the warning time exceeds warning time limit, the error tone will be repeated at this rate. The UP ARROW and DOWN ARROW buttons are used to increase and decrease the warning repeat rate. Pressing the *Enter* button will save the displayed value in the active configuration and exit the warning repeat rate adjust command. Pressing the LEFT ARROW will discard any changes made and restore the warning repeat rate to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the air exchange warning repeat rate is 30 seconds. The maximum air exchange warning repeat rate is 29 minutes and 59 seconds.

```

Warning Pressure
Warning Time Limit
Warning Repeat Rate
Timer Clear Delay
  
```

Figure 205

```

Warning Repeat Rate

This command can be
used to change the
air exchange warn-
ing repeat rate.

→ to continue
  
```

Figure 206

```

Warning Repeat Rate

00:30

→ move to next field
↑↓ to change value
ENTER to save & exit
← to quit (no save)
DISPLAY to exit menu
  
```

Figure 207

CURRENT SETTINGS

TIMER CLEAR DELAY

The timer clear delay command can be used to set the air exchange timer clear delay. With the cursor on the “Timer Clear Delay” menu item (see Figure 208), pressing the RIGHT ARROW will display the timer clear delay help screen (see Figure 209). Pressing the RIGHT ARROW button again will move past the help screen to the “Timer Clear Delay” command (see Figure 210). If the air exchange surgical function is on and an overpressure condition exists, the duration of the overpressure will be displayed. Once the over pressure condition is removed, the timer will automatically be cleared after this delay. If the timer clear delay is zero, the timer will only be cleared when the air exchange is turned off and on. The UP ARROW and DOWN ARROW buttons are used to increase and decrease the timer clear delay. Pressing the *Enter* button will save the displayed value in the active configuration and exit the timer clear delay adjust command. Pressing the LEFT ARROW will discard any changes made and restore the timer clear delay to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the air exchange timer clear delay is 15 seconds. The maximum air exchange repeat rate is 4 minutes and 59 seconds.

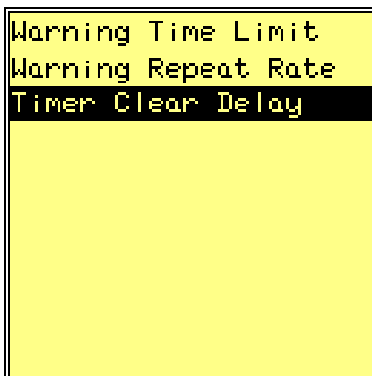


Figure 208

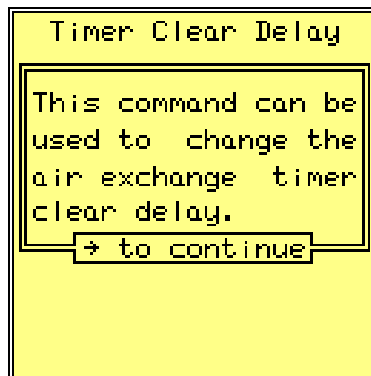


Figure 209

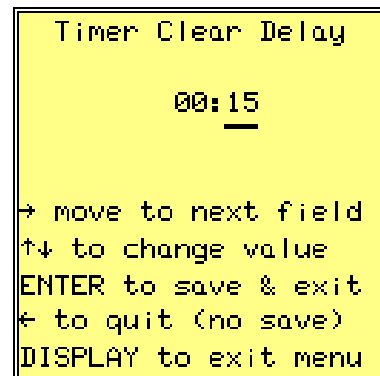


Figure 210

VITRECTOR VALUES

The vitrector values menu has items used to control the vitrector surgical function. With the cursor on the “Vitrector Values” menu item (see Figure 211), pressing the RIGHT ARROW will display the vitrector values help screen (see Figure 212). This help screen indicates that a toggle entry is present in the vitrector values menu list. A menu item that ends with the double arrow character will toggle between two values when the *Enter* button is pressed. Pressing the RIGHT ARROW button will move past the help screen to the vitrector values menu (see Figure 213). At the top of the display, the text VITRECTOR VALUES indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the

CURRENT SETTINGS

previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position. To exit the utilities menu, press the *Display* button.

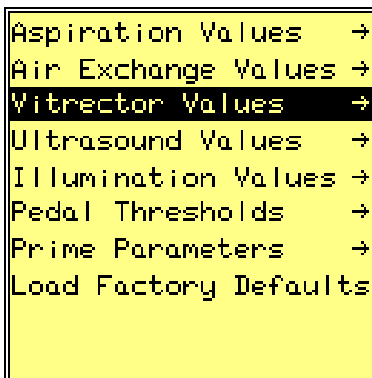


Figure 211

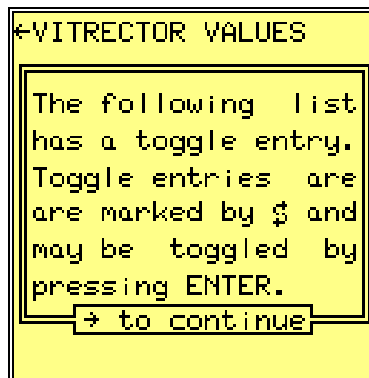


Figure 212

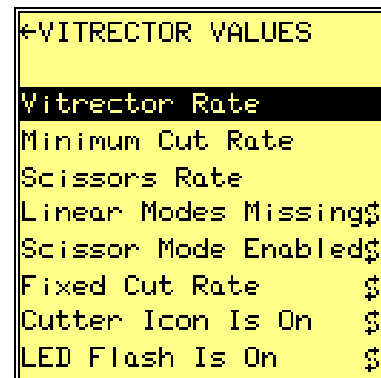


Figure 213

VITRECTOR RATE

The vitrector rate command can be used to set the vitrector cut rate. With the cursor on the “Vitrector Rate” menu item (see Figure 213), pressing the RIGHT ARROW will display the vitrector rate adjust help screen (see Figure 214). Pressing the RIGHT ARROW button again will move past the help screen to the “Vitrector Rate Adjust” command (see Figure 215). The UP ARROW and DOWN ARROW buttons are used to increase and decrease the vitrector cut rate. Changing this value will have an immediate effect on the Vitrector surgical function, if it is enabled and in one of the vitrector modes. Likewise, if the surgical function is enabled and in one of the vitrector modes, changing the vitrector cut rate using the Vitrector UP and DOWN buttons will cause the displayed value to change. Pressing the *Enter* button will save the displayed value in the active configuration and exit the vitrector rate adjust command. Pressing the LEFT ARROW will discard any changes made and restore the vitrector cut rate to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the vitrector cut rate is 600 cuts per minute.

CURRENT SETTINGS

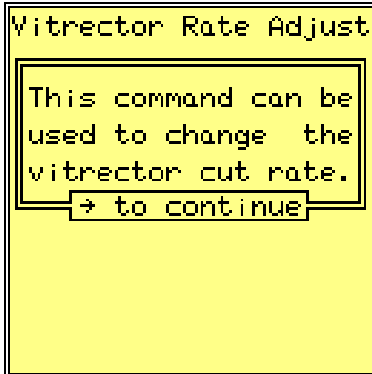


Figure 214

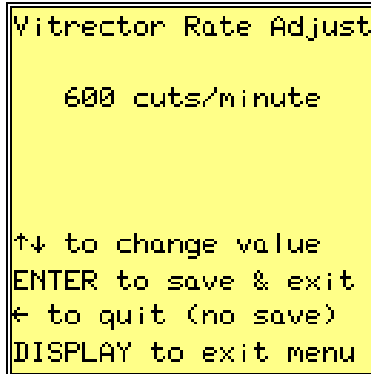


Figure 215

MINIMUM CUT RATE

The minimum cut rate command can be used to set the minimum cut rate for vitrector linear cut rate modes. With the cursor on the “Minimum Cut Rate” menu item (see Figure 216), pressing the RIGHT ARROW will display the minimum cut rate help screen (see Figure 217). Pressing the RIGHT ARROW button again will move past the help screen to the “Minimum Cut Rate” command (see Figure 218). The UP ARROW and DOWN ARROW buttons are used to increase and decrease the minimum cut rate. Changing this value will have an immediate effect on the Vitrector surgical function, if it is enabled and in a linear cut rate mode. Pressing the *Enter* button will save the displayed value in the active configuration and exit the minimum cut rate command. Pressing the LEFT ARROW will discard any changes made and restore the minimum cut rate to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the minimum cut rate is 400 cuts per minute.

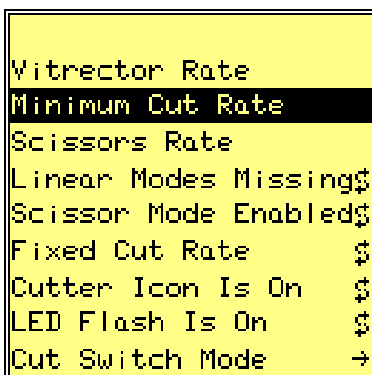


Figure 216

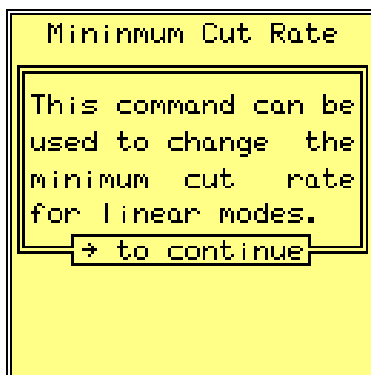


Figure 217

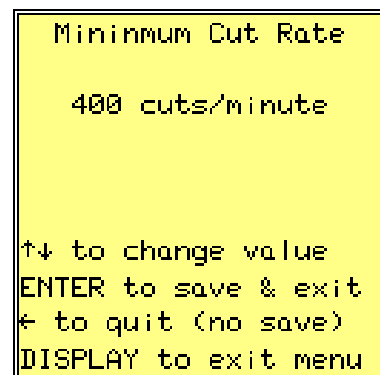


Figure 218

CURRENT SETTINGS

SCISSORS RATE

The scissors rate command can be used to set the scissors cut rate. With the cursor on the “Scissors Rate” menu item (see Figure 219), pressing the RIGHT ARROW will display the vitrector rate adjust help screen (see Figure 220). Pressing the RIGHT ARROW button again will move past the help screen to the “Scissors Rate Adjust” command (see Figure 221). The UP ARROW and DOWN ARROW buttons are used to increase and decrease the scissors cut rate. Changing this value will have an immediate effect on the Vitrector surgical function, if it is enabled and in scissors mode. Likewise, if the surgical function is enabled and in scissors mode, changing the scissors cut rate using the Vitrector UP and DOWN buttons will cause the displayed value to change. Pressing the *Enter* button will save the displayed value in the active configuration and exit the scissors rate adjust command. Pressing the LEFT ARROW will discard any changes made and restore the scissors cut rate to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the scissors cut rate is 200 cuts per minute.

```
Vitrector Rate
Minimum Cut Rate
Scissors Rate
Linear Modes Missing$
Scissor Mode Enabled$
Fixed Cut Rate      $
Cutter Icon Is On   $
LED Flash Is On     $
Cut Switch Mode     →
Single Cut Options  →
```

Figure 219

```
Scissors Rate Adjust

This command can be
used to change the
scissors cut rate.
→ to continue
```

Figure 220

```
Scissors Rate Adjust

200 cuts/minute

↑↓ to change value
ENTER to save & exit
← to quit (no save)
DISPLAY to exit menu
```

Figure 221

LINEAR MODES MISSING/LINEAR MODES ENABLED

This menu item can be used to enable and disable linear modes for the vitrector surgical function. With the cursor on the “Linear Modes Missing” menu item (see Figure 222), pressing the *Enter* button will change the menu item to “Linear Modes Enabled”. Likewise, with the cursor on the “Linear Modes Enabled” menu item (see Figure 223), pressing the *Enter* button will change the menu item to “Linear Modes Missing”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. While linear modes are enabled, two additional modes can be selected using the vitrector on/off button. The two linear cut rate modes made available are anterior linear rate and posterior linear rate. When the vitrector surgical function is in linear cut rate mode, aspiration is in fixed mode and the cut rate will change with foot pedal position. When disabled

CURRENT SETTINGS

the linear cut rate modes are not available using the vitrector on/off button. The factory default is linear modes missing.

Minimum Cut Rate	
Scissors Rate	
Linear Modes Missing\$	
Scissor Mode Enabled\$	
Fixed Cut Rate	\$
Cutter Icon Is On	\$
LED Flash Is On	\$
Cut Switch Mode	→
Single Cut Options	→
Pick Vitrector Style	→

Figure 222

Minimum Cut Rate	
Scissors Rate	
Linear Modes Enabled\$	
Scissor Mode Enabled\$	
Fixed Cut Rate	\$
Cutter Icon Is On	\$
LED Flash Is On	\$
Cut Switch Mode	→
Single Cut Options	→
Pick Vitrector Style	→

Figure 223

SCISSOR MODE MISSING/SCISSOR MODE ENABLED

This menu item can be used to enable and disable scissors mode for the vitrector surgical function. With the cursor on the “Scissor Mode Missing” menu item (see Figure 224), pressing the *Enter* button will change the menu item to “Scissor Mode Enabled”. Likewise, with the cursor on the “Scissor Mode Enabled” menu item (see Figure 225), pressing the *Enter* button will change the menu item to “Scissor Mode Missing”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. While scissors mode is enabled, scissors mode can be selected using the vitrector on/off button. When disabled the scissors mode is not available using the vitrector on/off button. The factory default is scissors mode enabled.

Scissors Rate	
Linear Modes Missing\$	
Scissor Mode Missing\$	
Fixed Cut Rate	\$
Cutter Icon Is On	\$
LED Flash Is On	\$
Cut Switch Mode	→
Single Cut Options	→
Pick Vitrector Style	→
Pick Scissors Style	→

Figure 224

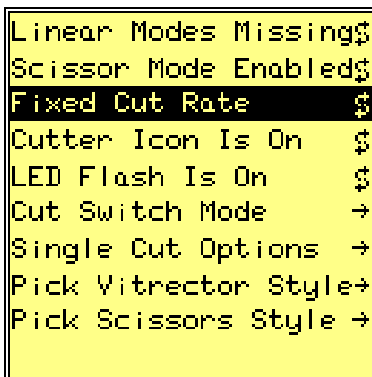
Scissors Rate	
Linear Modes Missing\$	
Scissor Mode Enabled\$	
Fixed Cut Rate	\$
Cutter Icon Is On	\$
LED Flash Is On	\$
Cut Switch Mode	→
Single Cut Options	→
Pick Vitrector Style	→
Pick Scissors Style	→

Figure 225

CURRENT SETTINGS

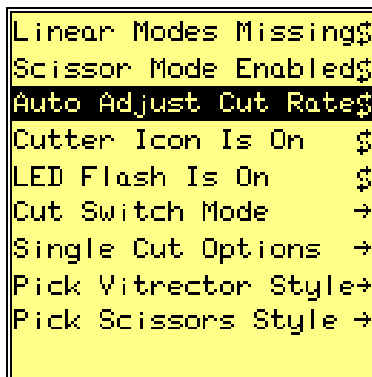
FIXED CUT RATE/AUTO ADJUST CUT RATE

This menu item can be used to select the vitrector cut rate mode. With the cursor on the “Fixed Cut Rate” menu item (see Figure 226), pressing the *Enter* button will change the menu item to “Auto Adjust Cut Rate”. Likewise, with the cursor on the “Auto Adjust Cut Rate” menu item (see Figure 227), pressing the *Enter* button will change the menu item to “Fixed Cut Rate”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. While in fixed cut rate mode, the vitrector cut rate will remain at the user specified cut rate and if insufficient drive pressure is detected, cutting will stop. Insufficient vitrector drive pressure should only be present at very high cut rates. While in auto adjust cut rate mode, if insufficient drive pressure is detected, the vitrector cut rate is automatically adjusted to a lower rate. The factory default is fixed cut rate.



```
Linear Modes Missing$
Scissor Mode Enabled$
Fixed Cut Rate      $
Cutter Icon Is On   $
LED Flash Is On     $
Cut Switch Mode     →
Single Cut Options  →
Pick Vitrector Style→
Pick Scissors Style →
```

Figure 226



```
Linear Modes Missing$
Scissor Mode Enabled$
Auto Adjust Cut Rate$
Cutter Icon Is On   $
LED Flash Is On     $
Cut Switch Mode     →
Single Cut Options  →
Pick Vitrector Style→
Pick Scissors Style →
```

Figure 227

CUTTER ICON IS ON/CUTTER ICON IS OFF

This menu item can be used to enable or disable the cutter icon. With the cursor on the “Cutter Icon Is On” menu item (see Figure 228), pressing the *Enter* button will change the menu item to “Cutter Icon Is Off”. Likewise, with the cursor on the “Cutter Icon Is Off” menu item (see Figure 229), pressing the *Enter* button will change the menu item to “Cutter Icon Is On”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. The cutter icon is a visual indication of the vitrector cut enable foot pedal switch. If the foot pedal switch is in a state that allows the vitrector to cut, the icon will be displayed. The icon will also show activity while the vitrector is cutting. The factory default has the cutter icon on.

CURRENT SETTINGS

Scissor Mode Enabled\$
Fixed Cut Rate \$
Cutter Icon Is On \$
LED Flash Is On \$
Cut Switch Mode →
Single Cut Options →
Pick Vitrector Style→
Pick Scissors Style →

Figure 228

Scissor Mode Enabled\$
Fixed Cut Rate \$
Cutter Icon Is Off \$
LED Flash Is On \$
Cut Switch Mode →
Single Cut Options →
Pick Vitrector Style→
Pick Scissors Style →

Figure 229

LED FLASH IS ON/LED FLASH IS OFF

This menu item can be used to enable or disable the cutter enabled LED indication. With the cursor on the “LED Flash Is On” menu item (see Figure 230), pressing the *Enter* button will change the menu item to “LED Flash Is Off”. Likewise, with the cursor on the “LED Flash Is Off” menu item (see Figure 231), pressing the *Enter* button will change the menu item to “LED Flash Is On”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. The vitrector surgical function LED flash is a visual indication of the vitrector cut enable foot pedal switch. If the foot pedal switch is in a state that allows the vitrector to cut, the vitrector surgical function LED will flash. The factory default has the cutter enabled LED indication on.

Fixed Cut Rate \$
Cutter Icon Is On \$
LED Flash Is On \$
Cut Switch Mode →
Single Cut Options →
Pick Vitrector Style→
Pick Scissors Style →

Figure 230

Fixed Cut Rate \$
Cutter Icon Is On \$
LED Flash Is Off \$
Cut Switch Mode →
Single Cut Options →
Pick Vitrector Style→
Pick Scissors Style →

Figure 231

CURRENT SETTINGS

CUT SWITCH MODE

The cut switch mode menu has items used to select the cut switch mode for the vitrector surgical function. The cut switch mode can be independently selected for the vitrector and scissors modes. With the cursor on the “Cut Switch Mode” menu item (see Figure 232), pressing the RIGHT ARROW will display the cut switch mode help screen (see Figure 233). This help screen indicates that a toggle entry is present in the cut switch mode menu list. A menu item that ends with the double arrow character will toggle between two values when the *Enter* button is pressed. Pressing the RIGHT ARROW button will move past the help screen to the cut switch mode menu (see Figure 234). At the top of the display, the text CUT SWITCH MODE indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position. To exit the utilities menu, press the *Display* button.

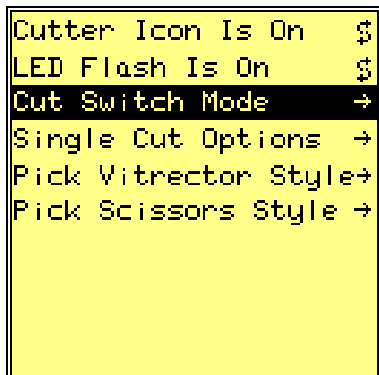


Figure 232

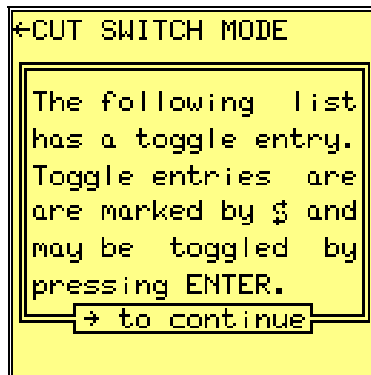


Figure 233

VITRECTOR MOMENTARY/VITRECTOR IS TOGGLE

This menu item will select the action of the foot pedal cut enable switch for the vitrector modes. With the cursor on the “Vitrector Momentary” menu item (see Figure 234), pressing the *Enter* button will change the menu item to “Vitrector Is Toggle”. Likewise, with the cursor on the “Vitrector Is Toggle” menu item (see Figure 235), pressing the *Enter* button will change the menu item to “Vitrector Momentary”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. If the switch is in the momentary mode, the cutter will only be enabled when the foot pedal is held in the active position. If the switch is in the toggle mode, activating the foot pedal switch will toggle the vitrector enable between enabled and disabled. The factory default for vitrector modes has the foot pedal cut enable switch in the toggle mode.

CURRENT SETTINGS

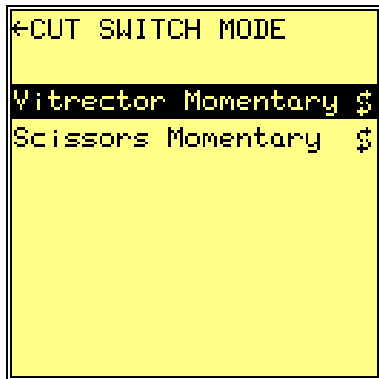


Figure 234

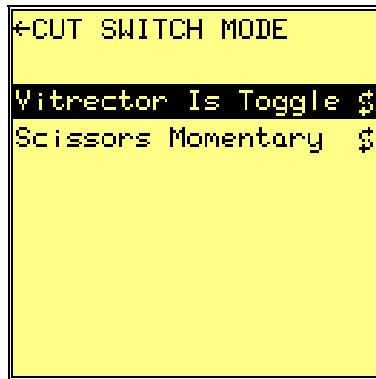


Figure 235

SCISSORS MOMENTARY/SCISSORS IS TOGGLE

This menu item will select the action of the foot pedal cut enable switch for scissors mode. With the cursor on the “Scissors Momentary” menu item (see Figure 236), pressing the *Enter* button will change the menu item to “Scissors Is Toggle”. Likewise, with the cursor on the “Scissors Is Toggle” menu item (see Figure 237), pressing the *Enter* button will change the menu item to “Scissors Momentary”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. If the switch is in the momentary mode, the cutter will only be enabled when the foot pedal is held in the active position. If the switch is in the toggle mode, activating the foot pedal switch will toggle the vitrector enable between enabled and disabled. The factory default for scissors mode has the foot pedal cut enable switch in the momentary mode.



Figure 236

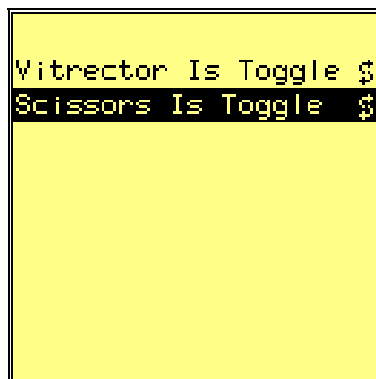


Figure 237

CURRENT SETTINGS

SINGLE CUT OPTIONS

The single cut options menu has items used to control access to the vitrector surgical functions single cut mode. With the cursor on the “Single Cut Options” menu item (see Figure 238), pressing the RIGHT ARROW will display the single cut options help screen (see Figure 239). This help screen indicates that a toggle entry is present in the single cut options menu list. A menu item that ends with the double arrow character will toggle between two values when the *Enter* button is pressed. Pressing the RIGHT ARROW button will move past the help screen to the single cut options menu (see Figure 240). At the top of the display, the text SINGLE CUT OPTIONS indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position. To exit the utilities menu, press the *Display* button.

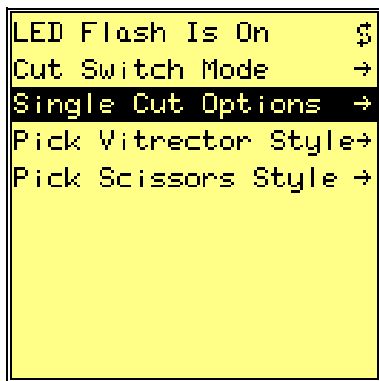


Figure 238

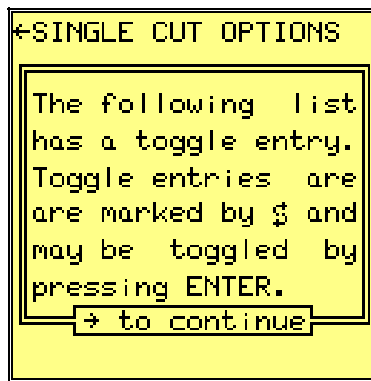


Figure 239

NOT ON REFLUX SIDE/REFLUX SIDE PED DOWN

This menu item will select the action of the foot pedal reflux enable switch when the foot pedal is depressed. With the cursor on the “Not On Reflux Side” menu item (see Figure 240), pressing the *Enter* button will change the menu item to “Reflux Side Ped Down”. Likewise, with the cursor on the “Reflux Side Ped Down” menu item (see Figure 241), pressing the *Enter* button will change the menu item to “Not On Reflux Side”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. When “Reflux Side Ped Down” is displayed, activating the reflux switch with the foot pedal down will cause a single cut of the vitrector. When “Not On Reflux Side” is displayed, activating the reflux switch with the foot pedal down will not cause a single cut of the vitrector. The factory default disables single cut mode on the reflux switch.

CURRENT SETTINGS

```
*SINGLE CUT OPTIONS
Not On Reflux Side $
Not On Enable Side $
Hold On/Off Button $
```

Figure 240

```
*SINGLE CUT OPTIONS
Reflux Side Ped Down$
Not On Enable Side $
Hold On/Off Button $
```

Figure 241

NOT ON ENABLE SIDE/ENABLE SIDE PEDAL UP

This menu item will select the action of the foot pedal cut enable switch when the foot pedal is not depressed. With the cursor on the “Not On Enable Side” menu item (see Figure 242), pressing the *Enter* button will change the menu item to “Enable Side Pedal Up”. Likewise, with the cursor on the “Enable Side Pedal Up” menu item (see Figure 243), pressing the *Enter* button will change the menu item to “Not On Enable Side”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. When “Enable Side Pedal Up” is displayed, activating the cut enable switch with the foot pedal up will cause a single cut of the vitrector. When “Not On Enable Side” is displayed, activating the cut enable switch with the foot pedal up will not cause a single cut of the vitrector. The factory default disables single cut mode on the cut enable switch.

```
Not On Reflux Side $
Not On Enable Side $
Hold On/Off Button $
```

Figure 242

```
Not On Reflux Side $
Enable Side Pedal Up$
Hold On/Off Button $
```

Figure 243

CURRENT SETTINGS

HOLD ON/OFF DISABLED / HOLD ON/OFF BUTTON

This menu item will select the action taken by holding the vitrector on/off button. With the cursor on the “Hold On/Off Disabled” menu item (see Figure 244), pressing the *Enter* button will change the menu item to “Hold On/Off Button”. Likewise, with the cursor on the “Hold On/Off Button” menu item (see Figure 245), pressing the *Enter* button will change the menu item to “Hold On/Off Disabled”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. When “Hold On/Off Button” is displayed, pressing and holding the vitrector on/off button for one second will toggle between single cut mode and rapid cut mode. When “Hold On/Off Disabled” is displayed, pressing and holding the vitrector on/off button will take no action. The factory default allows holding the vitrector on/off button to switch between single cut mode and rapid cut mode.

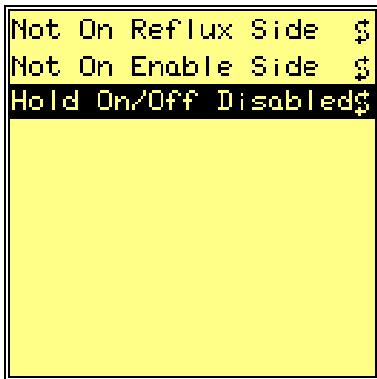


Figure 244

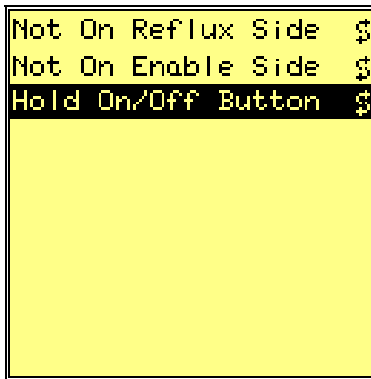


Figure 245

PICK VITRECTOR STYLE

The pick vitrector style menu has items concerning the pressure pulse generated on the vitrector output port, while in one of the vitrector modes. With the cursor on the “Pick Vitrector Style” menu item (see Figure 246), pressing the RIGHT ARROW will display the pick vitrector style menu (see Figure 247). At the top of the display, the text PICK VITRECTOR STYLE indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position. To exit the utilities menu, press the *Display* button.

CURRENT SETTINGS

```
Cut Switch Mode      →  
Single Cut Options  →  
Pick Vitrector Style→  
Pick Scissors Style →
```

Figure 246

```
*PICK VITRECTOR STYLE  
By Reorder Number  →  
Pulse Width Status
```

Figure 247

BY REORDER NUMBER

The by reorder number command can be used to select the vitrector pulse width parameters by reorder number. When using vitrectors provided by Syntec, selecting the vitrector style by reorder number will give optimal operation of the vitrector. Four sets of pulse width parameters are available. The entry 1025, 1026, 1027 should be selected when Reorder #1025, Reorder #1026 or Reorder #1027 vitrectors are used. The entry 1022, 1023 should be selected when Reorder #1022 or Reorder #1023 vitrectors are used. The entry 1020, 1021 should be selected when Reorder #1020 or Reorder #1021 vitrectors are used. The entry 1024 should be selected when Reorder #1024 vitrectors are used. When the reorder number for the vitrector being used is unknown, use the custom style entry. The pulse width parameters for the custom style entry default to values that will give acceptable operation of most vitrectors. The pulse width parameters for the custom style are field adjustable (see ADJUST CUSTOM STYLE, FOR VITRECTOR page 259). With the cursor on the “By Reorder Number” menu item (see Figure 247), pressing the RIGHT ARROW will display the by reorder number help screen (see Figure 248). This help screen describes how to select an item from a list. Pressing the RIGHT ARROW button again will move past the help screen to the “By Reorder Number” list (see Figure 249). The currently selected item is marked with an asterisk. Using the UP ARROW and DOWN ARROW buttons, move the cursor to the desired item and press *Enter*. The asterisk will move the newly selected item. To exit this list, press the LEFT ARROW button. To exit the utilities menu, press the *Display* button. The factory default for selection is the custom style entry.

CURRENT SETTINGS

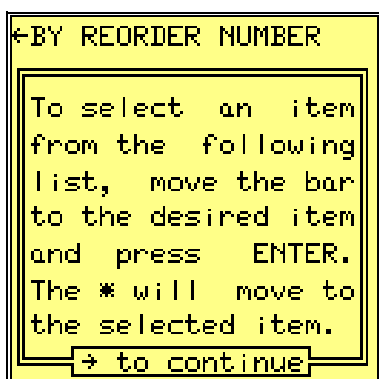


Figure 248

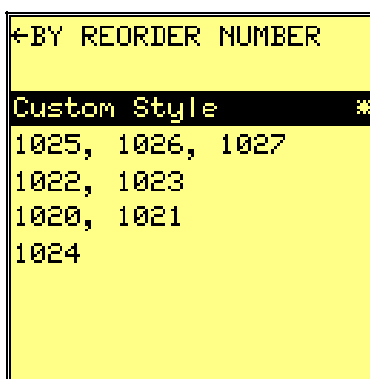


Figure 249

PULSE WIDTH STATUS

The pulse width status command will display the cut rate/pulse width value pairs for the active pulse width table. The current maximum cut rate allowed, the pulse width modifier, the current cut rate and the current output pulse width are also displayed. The active pulse width table is used to specify the pulse width for the pressure pulse generated on the vitrector output port. Up to eight cut rate/pulse width pairs may be used to modify the vitrector output pulse width. If the current cut rate is below the lowest cut rate specified, the pulse width of the vitrector output pulse will be specified by the pulse width paired with the lowest cut rate specified. If the current cut rate is above the highest cut rate specified, the pulse width of the vitrector output pulse will be specified by the pulse width paired with the highest cut rate specified. If the current cut rate falls on a cut rate found in the table, the pulse width of the vitrector output pulse will be specified by the pulse width paired with the cut rate. If the current cut rate falls between two cut rates specified, the pulse of the vitrector output pulse will vary linearly between the two pulse widths. Note that the order of the cut rate/pulse width pairs in the table will have no effect on the pulse width generated. The Max Rate value specifies the maximum cut rate selectable for the vitrector surgical function. The Modifier value is used to fine tune vitrector performance and is always added to the specified pulse width values. The current cut rate and pulse width are also displayed. With the cursor on the "Pulse Width Status" menu item (see Figure 250), pressing the RIGHT ARROW will display the pulse width status help screen (see Figure 251). Pressing the RIGHT ARROW button again will move past the help screen to the "Pulse Width Status" display (see Figure 252). Initially the first four cut rate/pulse width pairs are displayed. To display the next four, press the RIGHT ARROW button (see Figure 253). To exit, press the LEFT ARROW button. To exit the utilities menu, press the *Display* button.

CURRENT SETTINGS

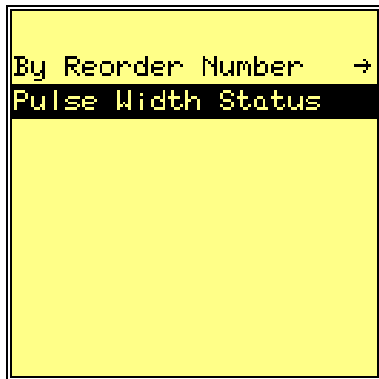


Figure 250

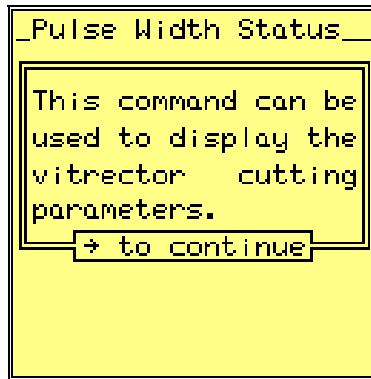


Figure 251

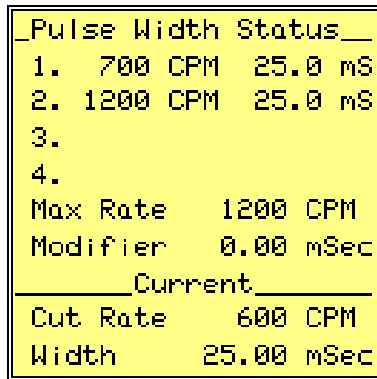


Figure 252

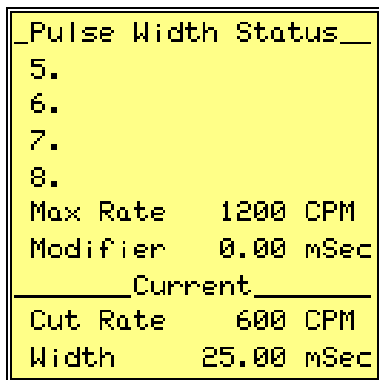


Figure 253

PICK SCISSORS STYLE

The pick scissors style menu has items concerning the pressure pulse generated on the vitrector output port, while in scissors mode. With the cursor on the “Pick Scissors Style” menu item (see Figure 254), pressing the RIGHT ARROW will display the pick scissors style menu (see Figure 255). At the top of the display, the text PICK SCISSORS STYLE indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position. To exit the utilities menu, press the *Display* button.

CURRENT SETTINGS

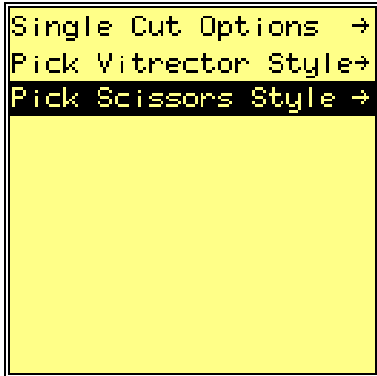


Figure 254

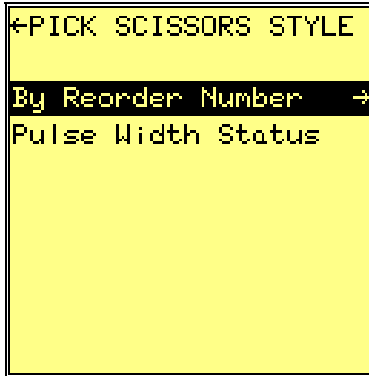


Figure 255

BY REORDER NUMBER

The by reorder number command can be used to select the scissors pulse width parameters by reorder number. When using scissors provided by Syntec, selecting the scissors style by reorder number will give optimal operation of the scissors. Two sets of pulse width parameters are available. The entry 1081 should be selected when Reorder #1081 scissors are used. When the reorder number for the scissors being used is unknown, use the custom style entry. The pulse width parameters for the custom style entry default to values that will give acceptable operation of most scissors. The pulse width parameters for the custom style are field adjustable (see ADJUST CUSTOM STYLE, FOR SCISSORS page 261). With the cursor on the “By Reorder Number” menu item (see Figure 255), pressing the RIGHT ARROW will display the by reorder number help screen (see Figure 256). This help screen describes how to select an item from a list. Pressing the RIGHT ARROW button again will move past the help screen to the “By Reorder Number” list (see Figure 257). The currently selected item is marked with an asterisk. Using the UP ARROW and DOWN ARROW buttons, move the cursor to the desired item and press *Enter*. The asterisk will move the newly selected item. To exit this list, press the LEFT ARROW button. To exit the utilities menu, press the *Display* button. The factory default for selection is the custom style entry.

CURRENT SETTINGS

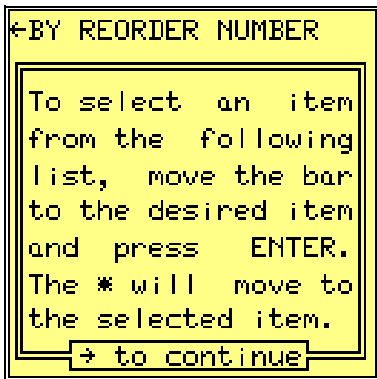


Figure 256

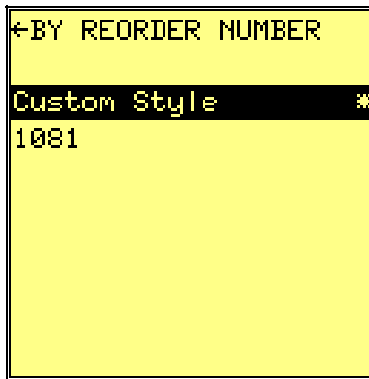


Figure 257

PULSE WIDTH STATUS

The pulse width status command will display the cut rate/pulse width value pairs for the active pulse width table. The current maximum cut rate allowed, the pulse width modifier, the current cut rate and the current output pulse width are also displayed. The active pulse width table is used to specify the pulse width for the pressure pulse generated on the vitrector output port. Up to eight cut rate/pulse width pairs may be used to modify the vitrector output pulse width. If the current cut rate is below the lowest cut rate specified, the pulse width of the vitrector output pulse will be specified by the pulse width paired with the lowest cut rate specified. If the current cut rate is above the highest cut rate specified, the pulse width of the vitrector output pulse will be specified by the pulse width paired with the highest cut rate specified. If the current cut rate falls on a cut rate found in the table, the pulse width of the vitrector output pulse will be specified by the pulse width paired with the cut rate. If the current cut rate falls between two cut rates specified, the pulse of the vitrector output pulse will vary linearly between the two pulse widths. Note that the order of the cut rate/pulse width pairs in the table will have no effect on the pulse width generated. The Max Rate value specifies the maximum cut rate selectable for the vitrector surgical function. The Modifier value is used to fine tune vitrector performance and is always added to the specified pulse width values. The current cut rate and pulse width are also displayed. With the cursor on the "Pulse Width Status" menu item (see Figure 258), pressing the RIGHT ARROW will display the pulse width status help screen (see Figure 259). Pressing the RIGHT ARROW button again will move past the help screen to the "Pulse Width Status" display (see Figure 260). Initially the first four cut rate/pulse width pairs are displayed. To display the next four, press the RIGHT ARROW button (see Figure 261). To exit, press the LEFT ARROW button. To exit the utilities menu, press the *Display* button.

CURRENT SETTINGS

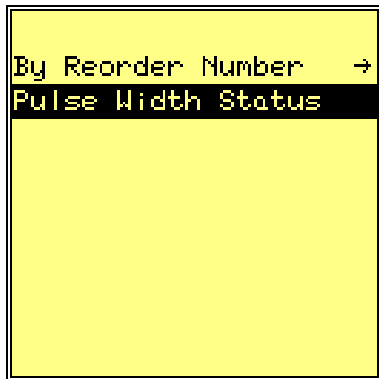


Figure 258

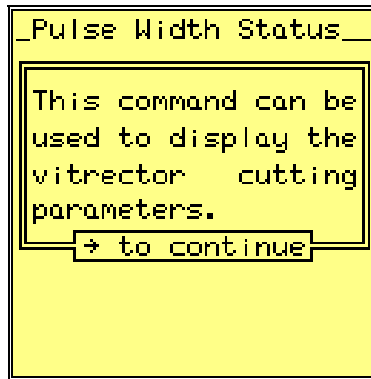


Figure 259

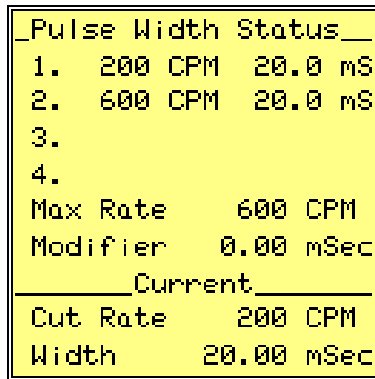


Figure 260

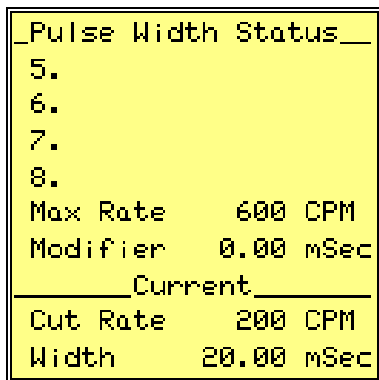


Figure 261

ULTRASOUND VALUES

The ultrasound values menu has items used to control the ultrasound surgical function. With the cursor on the "Ultrasound Values" menu item (see Figure 262), pressing the RIGHT ARROW will display the ultrasound values help screen (see Figure 263). This help screen indicates that a toggle entry is present in the ultrasound values menu list. A menu item that ends with the double arrow character will toggle between two values when the *Enter* button is pressed. Pressing the RIGHT ARROW button will move past the help screen to the vitrector values menu (see Figure 264). At the top of the display, the text ULTRASOUND VALUES indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position. To exit the utilities menu, press the *Display* button.

CURRENT SETTINGS

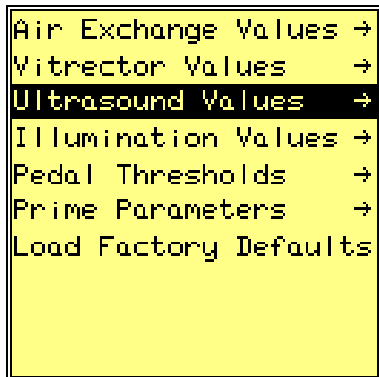


Figure 262

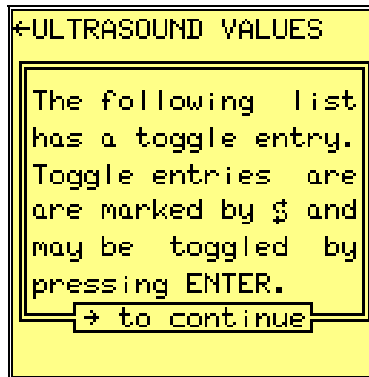


Figure 263

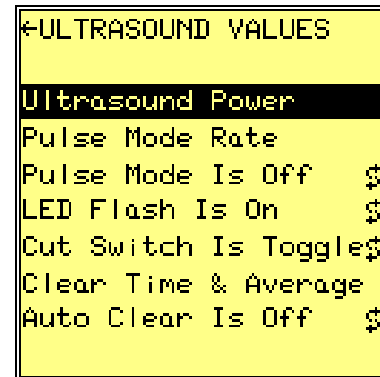


Figure 264

ULTRASOUND POWER

The ultrasound power command can be used to set the ultrasound power level. With the cursor on the “Ultrasound Power” menu item (see Figure 264), pressing the RIGHT ARROW will display the ultrasound power help screen (see Figure 265). Pressing the RIGHT ARROW button again will move past the help screen to the “Ultrasound Power” command (see Figure 266). The UP ARROW and DOWN ARROW buttons are used to increase and decrease the ultrasound power level. Changing this value will have an immediate effect on the Ultrasound surgical function, if it is enabled. Likewise, if the surgical function is enabled, changing the ultrasound power level using the Ultrasound UP and DOWN buttons will cause the displayed value to change. Pressing the *Enter* button will save the displayed value in the active configuration and exit the ultrasound power command. Pressing the LEFT ARROW will discard any changes made and restore the ultrasound power level to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the ultrasound power level is 50%.

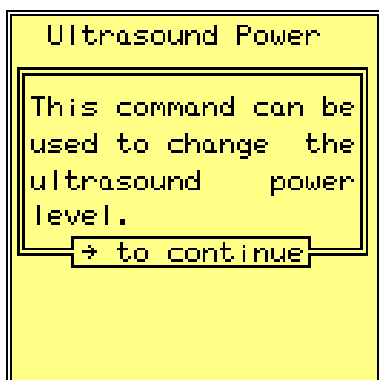


Figure 265

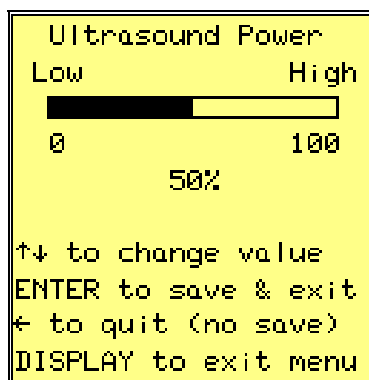


Figure 266

CURRENT SETTINGS

PULSE MODE RATE

The pulse mode rate command can be used to set the ultrasound pulse mode rate. With the cursor on the “Pulse Mode Rate” menu item (see Figure 267), pressing the RIGHT ARROW will display the pulse mode rate help screen (see Figure 268). Pressing the RIGHT ARROW button again will move past the help screen to the “Pulse Mode Rate” command (see Figure 269). The UP ARROW and DOWN ARROW buttons are used to increase and decrease the pulse mode rate. Changing this value will have an immediate effect on the Ultrasound surgical function, if it is enabled and pulse mode is on. Likewise, if the surgical function is enabled, and pulse mode is on, changing pulse mode rate using the Ultrasound pulse mode UP and DOWN buttons will cause the displayed value to change. Pressing the *Enter* button will save the displayed value in the active configuration and exit the pulse mode rate command. Pressing the LEFT ARROW will discard any changes made and restore pulse mode rate to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the ultrasound pulse mode rate is 10 pulses per second

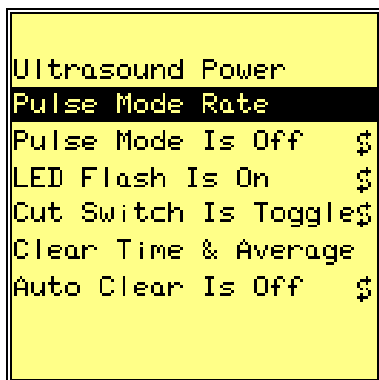


Figure 267

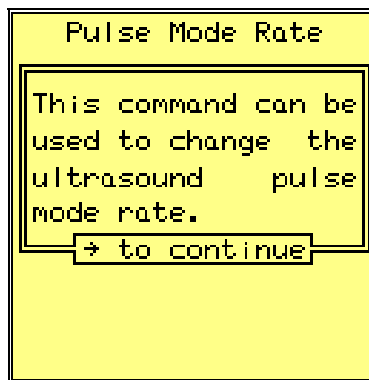


Figure 268

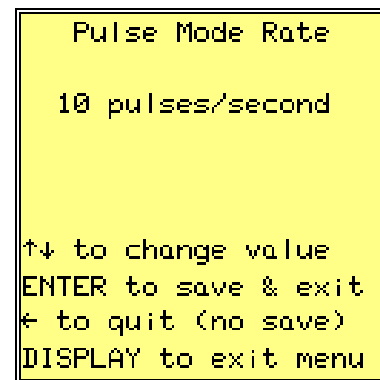


Figure 269

PULSE MODE IS ON/PULSE MODE IS OFF

This menu item can be used to enable or disable ultrasound pulse mode. With the cursor on the “Pulse Mode Is On” menu item (see Figure 270), pressing the *Enter* button will change the menu item to “Pulse Mode Is Off”. Likewise, with the cursor on the “Pulse Mode Is Off” menu item (see Figure 271), pressing the *Enter* button will change the menu item to “Pulse Mode Is On”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. Changing the pulse mode state while the Ultrasound surgical function is enabled will have an immediate effect. The factory default for the ultrasound pulse mode is off.

CURRENT SETTINGS

Ultrasound Power
Pulse Mode Rate
Pulse Mode Is On \$
LED Flash Is On \$
Cut Switch Is Toggle\$
Clear Time & Average
Auto Clear Is Off \$

Figure 270

Ultrasound Power
Pulse Mode Rate
Pulse Mode Is Off \$
LED Flash Is On \$
Cut Switch Is Toggle\$
Clear Time & Average
Auto Clear Is Off \$

Figure 271

LED FLASH IS ON/LED FLASH IS OFF

This menu item can be used to enable or disable the cutter enabled LED indication. With the cursor on the “LED Flash Is On” menu item (see Figure 272), pressing the *Enter* button will change the menu item to “LED Flash Is Off”. Likewise, with the cursor on the “LED Flash Is Off” menu item (see Figure 273), pressing the *Enter* button will change the menu item to “LED Flash Is On”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. The ultrasound surgical function LED flash is a visual indication of the ultrasound cut enable foot pedal switch. If the foot pedal switch is in a state that allows the ultrasound to cut, the ultrasound surgical function LED will flash. The factory default has the cutter enabled LED indication on.

Pulse Mode Rate
Pulse Mode Is Off \$
LED Flash Is On \$
Cut Switch Is Toggle\$
Clear Time & Average
Auto Clear Is Off \$

Figure 272

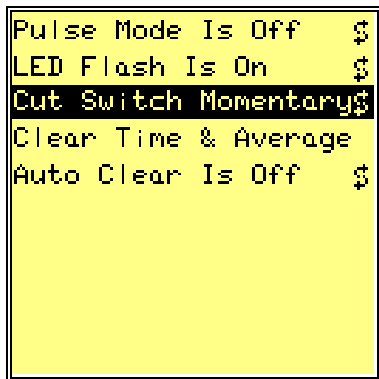
Pulse Mode Rate
Pulse Mode Is Off \$
LED Flash Is Off \$
Cut Switch Is Toggle\$
Clear Time & Average
Auto Clear Is Off \$

Figure 273

CURRENT SETTINGS

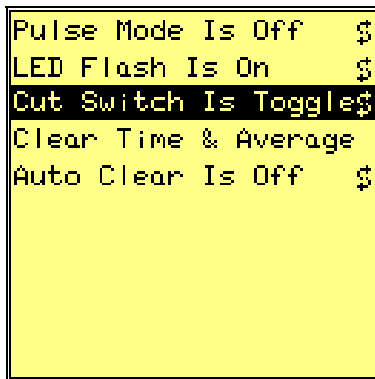
CUT SWITCH MOMENTARY/CUT SWITCH IS TOGGLE

This menu item will select the action of the foot pedal ultrasound enable switch. With the cursor on the “Cut Switch Momentary” menu item (see Figure 274), pressing the *Enter* button will change the menu item to “Cut Switch Is Toggle”. Likewise, with the cursor on the “Cut Switch Is Toggle” menu item (see Figure 275), pressing the *Enter* button will change the menu item to “Cut Switch Momentary”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. If the switch is in the momentary mode, the ultrasound will only be enabled when the foot pedal is held in the active position. If the switch is in the toggle mode, activating the foot pedal switch will toggle the ultrasound enable between enabled and disabled. The factory default has the foot pedal ultrasound enable switch in the toggle mode.



A screenshot of a menu interface with a yellow background. The menu items are: 'Pulse Mode Is Off \$', 'LED Flash Is On \$', 'Cut Switch Momentary\$', 'Clear Time & Average', and 'Auto Clear Is Off \$'. The 'Cut Switch Momentary\$' item is highlighted with a black background and white text.

Figure 274



A screenshot of a menu interface with a yellow background. The menu items are: 'Pulse Mode Is Off \$', 'LED Flash Is On \$', 'Cut Switch Is Toggle\$', 'Clear Time & Average', and 'Auto Clear Is Off \$'. The 'Cut Switch Is Toggle\$' item is highlighted with a black background and white text.

Figure 275

CLEAR TIME & AVERAGE

The clear time & average command can be used to clear the ultrasound usage statistics. With the cursor on the “Clear Time & Average” menu item (see Figure 276), pressing the RIGHT ARROW will display the clear time and average help screen (see Figure 277). Pressing the RIGHT ARROW button again will move past the help screen to the “Clear Time & Average” command (see Figure 278). Pressing the *Enter* button will clear the ultrasound usage time and average power values then exit the clear time & average command. Pressing the LEFT ARROW will exit the clear time & average command without clearing the time and average power values. To exit the utilities menu, press the *Display* button.

CURRENT SETTINGS

```
LED Flash Is On  $  
Cut Switch Is Toggle$  
Clear Time & Average  
Auto Clear Is Off  $
```

Figure 276

Clear Time & Average

This command can be
used to clear the
ultrasound average
power total and
accumulated time.

→ to continue

Figure 277

Clear Time & Average

Press ENTER to clear

ENTER to clear

← to quit (no clear)

DISPLAY to exit menu

Figure 278

AUTO CLEAR IS ON/AUTO CLEAR IS OFF

This menu item can be used to enable or disable auto clear of the ultrasound usage statistics. With the cursor on the “Auto Clear Is On” menu item (see Figure 279), pressing the *Enter* button will change the menu item to “Auto Clear Is Off”. Likewise, with the cursor on the “Auto Clear Is Off” menu item (see Figure 280), pressing the *Enter* button will change the menu item to “Auto Clear Is On”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. While auto clear is on, the ultrasound time and average values will be cleared whenever the ultrasound mode is changed. While auto clear is off, the ultrasound time and average values will accumulate, regardless of a change to the ultrasound mode. When the VitMan is powered up, the ultrasound time and average values are cleared. The “Clear Time & Average” menu item may also be used to clear the values. The factory default has auto clear off.

```
Cut Switch Is Toggle$  
Clear Time & Average  
Auto Clear Is On  $
```

Figure 279

```
Cut Switch Is Toggle$  
Clear Time & Average  
Auto Clear Is Off  $
```

Figure 280

CURRENT SETTINGS

ILLUMINATION VALUES

The illumination values menu has items used to control the illumination surgical function. With the cursor on the "Illumination Values" menu item (see Figure 281), pressing the RIGHT ARROW will display the illumination values help screen (see Figure 282). This help screen indicates that a toggle entry is present in the illumination values menu list. A menu item that ends with the double arrow character will toggle between two values when the *Enter* button is pressed. Pressing the RIGHT ARROW button will move past the help screen to the illumination values menu (see Figure 283). At the top of the display, the text ILLUMINATION VALUES indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position. To exit the utilities menu, press the *Display* button.

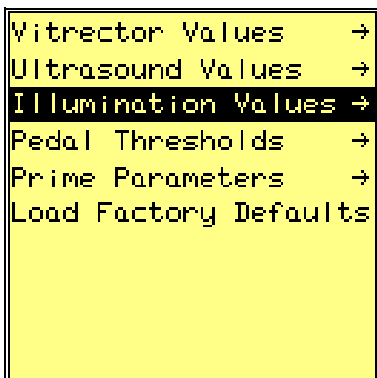


Figure 281

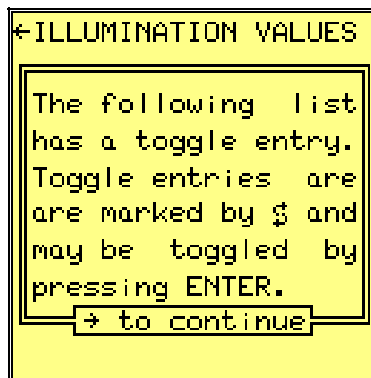


Figure 282

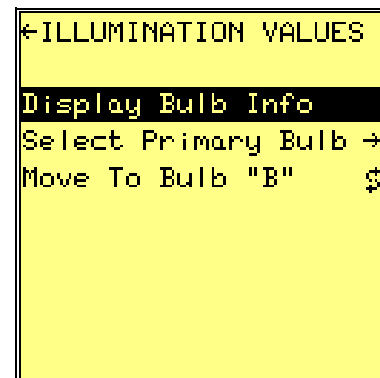


Figure 283

DISPLAY BULB INFO

The display bulb info command will display illumination bulb information. With the cursor on the "Display Bulb Info" menu item (see Figure 283), pressing the RIGHT ARROW will display the bulb information help screen (see Figure 284). Pressing the RIGHT ARROW button again will move past the help screen to the "Bulb Information" display (see Figure 285). The bulb information display will display the bulb state (present/MISSING/on/warming), the number of hours on the bulb and the date of replacement, for both bulbs. Pressing the RIGHT ARROW button again will move to the alternate "Bulb Information" display (see Figure 286). Each time the right arrow is pressed, the Replaced field will toggle between the date of replacement and the time of replacement. If the bulb is missing, the hours displayed are those accumulated subsequent to burning out. If a bulb burns out while illuminated, the next time a good bulb is detected the hours are cleared and the date is changed. If a bulb is changed before burning out, the "Service Menu:Service Illumination:Clear Bulb Hours" menu should be

CURRENT SETTINGS

used to clear the bulb hours and change the date. To exit, press the LEFT ARROW button. To exit the utilities menu, press the *Display* button.

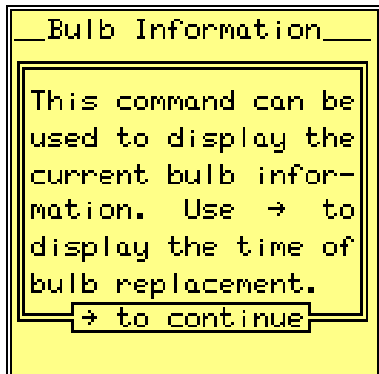


Figure 284

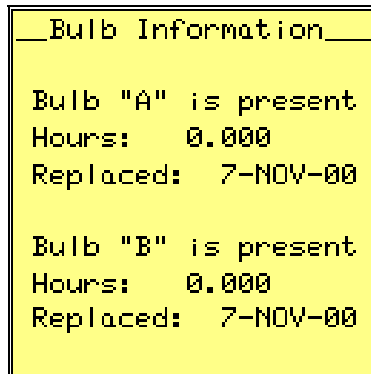


Figure 285

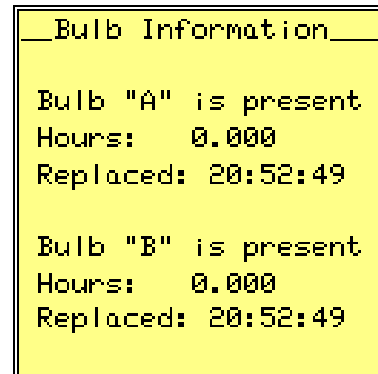


Figure 286

SELECT PRIMARY BULB

The select primary bulb command can be used to select bulb "A" or bulb "B" as the primary bulb. If a primary bulb is selected, when the illumination surgical function is enabled, the selected primary bulb will be illuminated, if it is present. Neither bulb may also be selected. In this case, the last selected bulb is the primary bulb. With the cursor on the "Select Primary Bulb" menu item (see Figure 287), pressing the RIGHT ARROW will display the select primary bulb help screen (see Figure 288). This help screen describes how to select an item from a list. Pressing the RIGHT ARROW button again will move past the help screen to the "Select Primary Bulb" list (see Figure 289). The currently selected item is marked with an asterisk. Using the UP ARROW and DOWN ARROW buttons, move the cursor to the desired item and press *Enter*. The asterisk will move to the newly selected item. To exit this list press the LEFT ARROW button. To exit the utilities menu, press the *Display* button. The factory default has neither bulb selected as primary.

CURRENT SETTINGS

```
Display Bulb Info
Select Primary Bulb →
Move To Bulb "B" $
```

Figure 287

```
*SELECT PRIMARY BULB

To select an item
from the following
list, move the bar
to the desired item
and press ENTER.
The * will move to
the selected item.

→ to continue
```

Figure 288

```
*SELECT PRIMARY BULB
Select No Primary *
Select "A" Primary
Select "B" Primary
```

Figure 289

MOVE TO BULB "A" / MOVE TO BULB "B"

This menu item can be used to select the currently active bulb. With the cursor on the "Move To Bulb "A"" menu item (see Figure 290), pressing the *Enter* button will change the menu item to "Move To Bulb "B"". Likewise, with the cursor on the "Move To Bulb "B"" menu item (see Figure 291), pressing the *Enter* button will change the menu item to "Move To Bulb "A"". This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. When "Move To Bulb "A"" is selected, the light source back-up mechanism will move to bulb "A". When "Move To Bulb "B"" is selected, the light source back-up mechanism will move to bulb "B". If the Illumination surgical function is enabled, the illuminated bulb will extinguish and the selected bulb will illuminate.

```
Display Bulb Info
Select Primary Bulb →
Move To Bulb "A" $
```

Figure 290

```
Display Bulb Info
Select Primary Bulb →
Move To Bulb "B" $
```

Figure 291

CURRENT SETTINGS

PEDAL THRESHOLDS

The pedal thresholds menu has items used to control the foot pedal thresholds. With the cursor on the “Pedal Thresholds” menu item (see Figure 292), pressing the RIGHT ARROW will display the pedal thresholds menu (see Figure 293). At the top of the display, the text PEDAL THRESHOLDS indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position. To exit the utilities menu, press the *Display* button.

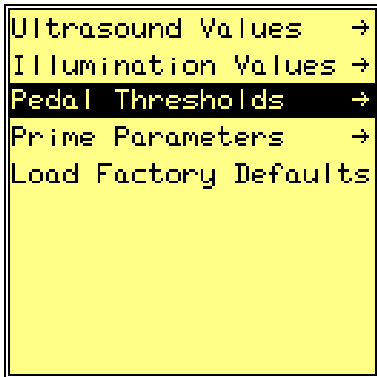


Figure 292

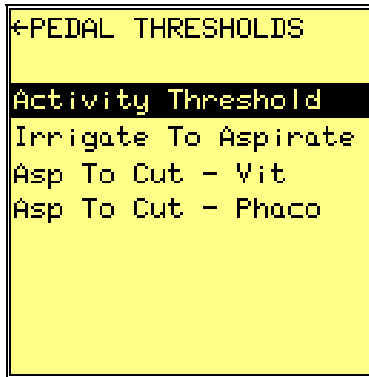


Figure 293

ACTIVITY THRESHOLD

The activity threshold command can be used to set the foot pedal activity threshold. With the cursor on the “Activity Threshold” menu item (see Figure 293), pressing the RIGHT ARROW will display the activity threshold help screen (see Figure 294). Pressing the RIGHT ARROW button again will move past the help screen to the “Activity Threshold” command (see Figure 295). The activity threshold is the percentage of foot pedal movement required before irrigation or cutting and aspiration will begin. The UP ARROW and DOWN ARROW buttons are used to increase and decrease the activity threshold percentage. Pressing the *Enter* button will save the displayed value in the active configuration and exit the activity threshold command. Pressing the LEFT ARROW will discard any changes made and restore the activity threshold to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the foot pedal activity threshold is 10%.

CURRENT SETTINGS

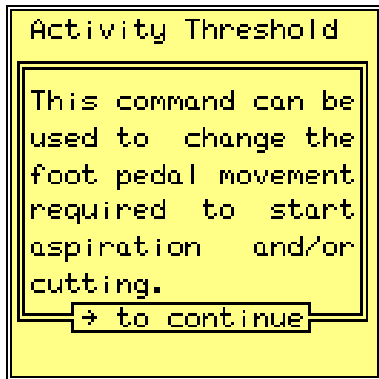


Figure 294

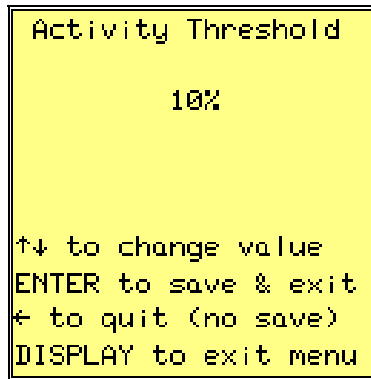


Figure 295

IRRIGATE TO ASPIRATE

The irrigate to aspirate command can be used to set the percentage foot pedal movement required between the start of irrigation to the start of aspiration. With the cursor on the “Irrigate To Aspirate” menu item (see Figure 296), pressing the RIGHT ARROW will display the irrigate to aspirate help screen (see Figure 297). Pressing the RIGHT ARROW button again will move past the help screen to the “Irrigate To Aspirate” command (see Figure 298). The irrigate to aspirate value is the percentage of foot pedal movement required after irrigation begins before cutting and aspiration will begin. This only has effect in anterior modes. The UP ARROW and DOWN ARROW buttons are used to increase and decrease the irrigate to aspirate percentage. Pressing the *Enter* button will save the displayed value in the active configuration and exit the irrigate to aspirate command. Pressing the LEFT ARROW will discard any changes made and restore the irrigate to aspirate percentage to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the percentage foot pedal movement required between the start of irrigation to the start of aspiration is 10%.

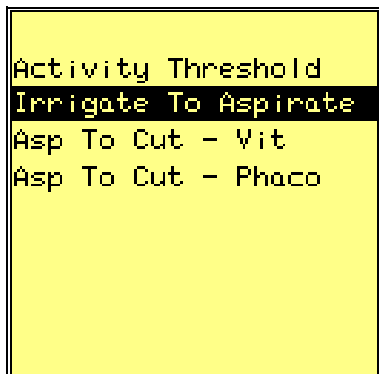


Figure 296

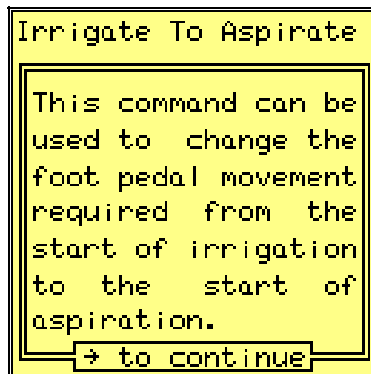


Figure 297

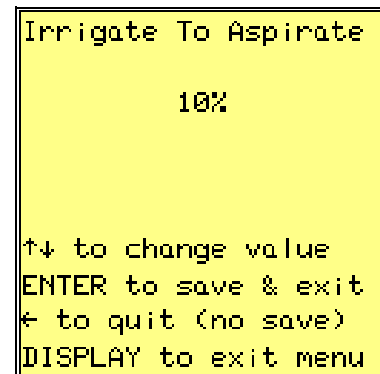


Figure 298

CURRENT SETTINGS

ASP TO CUT - VIT

The asp to cut - vit command can be used to set the percentage foot pedal movement required between the start of aspiration to the start of cutting. With the cursor on the “Asp To Cut - Vit” menu item (see Figure 299), pressing the RIGHT ARROW will display the asp to cut - vit help screen (see Figure 300). Pressing the RIGHT ARROW button again will move past the help screen to the “Asp To Cut - Vit” command (see Figure 301). The asp to cut - vit value is the percentage of foot pedal movement required after aspiration begins before cutting will begin. The UP ARROW and DOWN ARROW buttons are used to increase and decrease the asp to cut - vit percentage. Pressing the *Enter* button will save the displayed value in the active configuration and exit the asp to cut - vit command. Pressing the LEFT ARROW will discard any changes made and restore the asp to cut - vit percentage to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the percentage foot pedal movement required between the start of aspiration to the start of cutting is 0%.

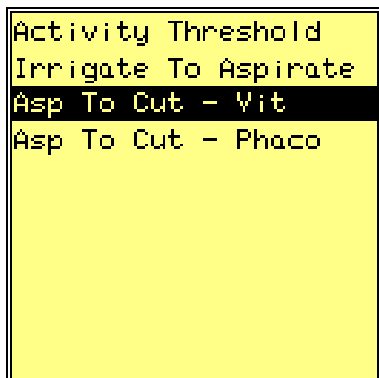


Figure 299

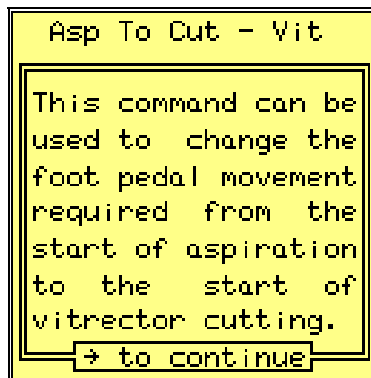


Figure 300

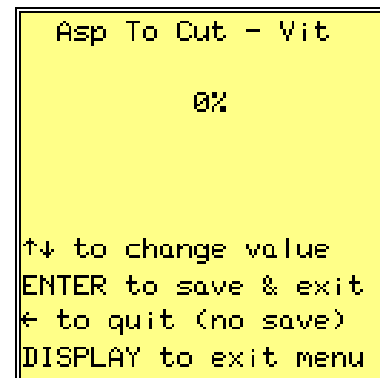


Figure 301

ASP TO CUT - PHACO

The asp to cut - phaco command can be used to set the percentage foot pedal movement required between the start of aspiration to the start of cutting. With the cursor on the “Asp To Cut - Phaco” menu item (see Figure 302), pressing the RIGHT ARROW will display the asp to cut - phaco help screen (see Figure 303). Pressing the RIGHT ARROW button again will move past the help screen to the “Asp To Cut - Phaco” command (see Figure 304). The asp to cut - phaco value is the percentage of foot pedal movement required after aspiration begins before cutting will begin. The UP ARROW and DOWN ARROW buttons are used to increase and decrease the asp to cut - phaco percentage. Pressing the *Enter* button will save the displayed value in the active configuration and exit the asp to cut - phaco command. Pressing the LEFT ARROW will discard any changes

CURRENT SETTINGS

made and restore the asp to cut - phaco percentage to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the percentage foot pedal movement required between the start of aspiration to the start of cutting is 10%.

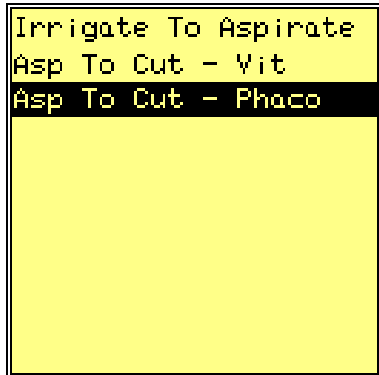


Figure 302

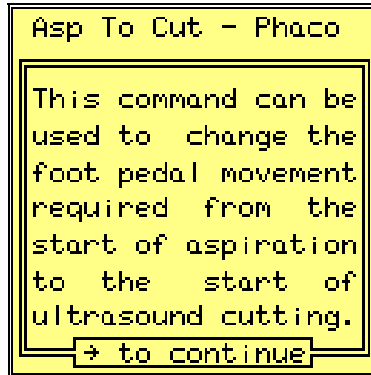


Figure 303

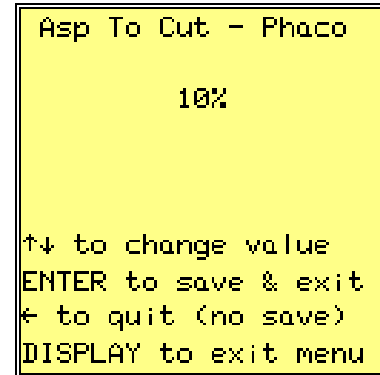


Figure 304

PRIME PARAMETERS

The prime parameters menu has items used to control the aspiration prime function. With the cursor on the "Prime Parameters" menu item (see Figure 305), pressing the RIGHT ARROW will display the prime parameters help screen (see Figure 306). This help screen indicates that a toggle entry is present in the prime parameters menu list. A menu item that ends with the double arrow character will toggle between two values when the *Enter* button is pressed. Pressing the RIGHT ARROW button will move past the help screen to the prime parameters menu (see Figure 307). At the top of the display, the text PRIME PARAMETERS indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position. To exit the utilities menu, press the *Display* button.

CURRENT SETTINGS

```
Illumination Values →  
Pedal Thresholds →  
Prime Parameters →  
Load Factory Defaults
```

Figure 305

```
*PRIME PARAMETERS  
  
The following list  
has a toggle entry.  
Toggle entries are  
marked by $ and  
may be toggled by  
pressing ENTER.  
→ to continue
```

Figure 306

```
*PRIME PARAMETERS  
Parameter Overview  
Prime Mode Select →  
Vitrector Duration  
Vitrector Level  
Vitrector Cut Time  
Ultrasound Duration  
Ultrasound Level  
Auto Tune Is Enabled$
```

Figure 307

PARAMETER OVERVIEW

The parameter overview command will display the current prime parameters. With the cursor on the “Parameter Overview” menu item (see Figure 307), pressing the RIGHT ARROW will display the parameter overview help screen (see Figure 308). Pressing the RIGHT ARROW button again will move past the help screen to the “Parameter Overview” display (see Figure 309). The parameter overview display will display the current prime mode, the duration and vacuum level for the vitrector and ultrasound, the cut time for the vitrector and the ultrasound auto tune state. The LEFT ARROW button will exit the parameter overview display. To exit the utilities menu, press the *Display* button. The factory defaults for the prime parameters are shown in Figure 309.

```
_Parameter Overview_  
  
This command will  
display the current  
prime parameters.  
→ to continue
```

Figure 308

```
_Parameter Overview_  
  
Mode desired: Timed  
Vit duration: 00:12  
Vit level: 400 mmHg  
Vit cut time: 00:10  
Ult duration: 00:04  
Ult level: 200 mmHg  
Ult auto tune: Yes
```

Figure 309

CURRENT SETTINGS

PRIME MODE SELECT

The prime mode select menu allows the prime mode to be selected. Two prime modes are available. While in timed prime mode, the prime cycle will last for the duration selected by the current surgical function. If the vitrector is on, the vitrector duration and level are used. If the ultrasound is on, the ultrasound duration and level are used. If neither function is on, the vitrector values are used, unless the ultrasound probe is connected. While in continuous prime mode, prime will continue until the aspiration valve open/close button is pressed or foot pedal activity is detected. With the cursor on the “Prime Mode Select” menu item (see Figure 310), pressing the RIGHT ARROW will display the prime mode select help screen (see Figure 311). This help screen describes how to select an item from a list. Pressing the RIGHT ARROW button again will move past the help screen to the “Prime Mode Select” list (see Figure 312). The currently selected item is marked with an asterisk. Using the UP ARROW and DOWN ARROW buttons, move the cursor to the desired item and press *Enter*. The asterisk will move to the newly selected item. To exit this list press the LEFT ARROW button. To exit the utilities menu, press the *Display* button. The factory default for the prime mode is timed prime cycle.

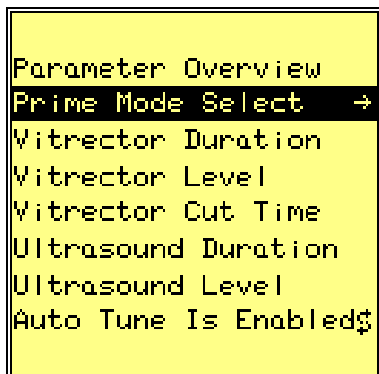


Figure 310

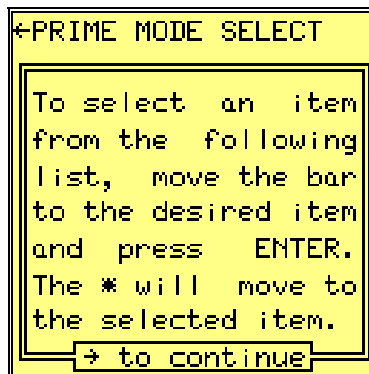


Figure 311

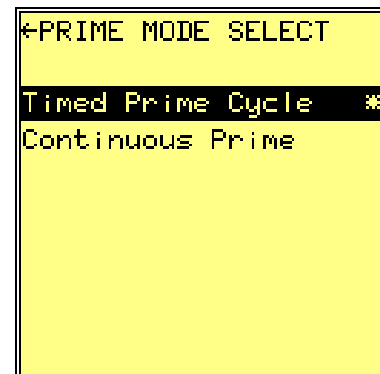


Figure 312

CURRENT SETTINGS

VITRECTOR DURATION

The vitrector duration parameter will specify the length of time the timed prime cycle will run for the vitrector. With the cursor on the “Vitrector Duration” menu item (see Figure 313), pressing the RIGHT ARROW will display the vitrector duration help screen (see Figure 314). Pressing the RIGHT ARROW button again will move past the help screen to the “Vitrector Duration” command (see Figure 315). The time is specified in minutes and seconds. The LEFT ARROW and RIGHT ARROW buttons will move the cursor between the minutes and seconds values. The UP ARROW and DOWN ARROW buttons are used to increase and decrease the time. Pressing the *Enter* button will save the displayed value in the active configuration and exit the vitrector duration command. Pressing the LEFT ARROW, with the cursor under the left most field, will discard any changes made and restore the vitrector duration to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the vitrector duration parameter is 12 seconds. The maximum value for the vitrector duration is 4 minutes and 59 seconds.

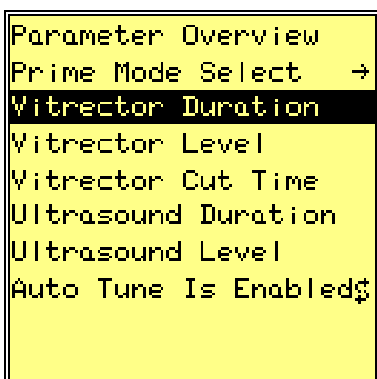


Figure 313

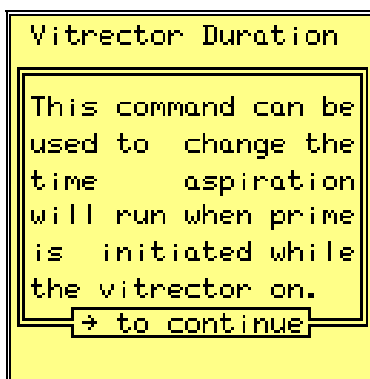


Figure 314

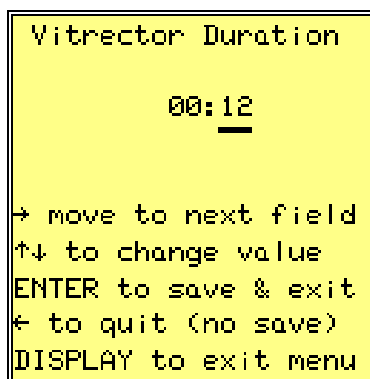


Figure 315

VITRECTOR LEVEL

The vitrector level command can be used to set the vitrector prime vacuum level. With the cursor on the “Vitrector Level” menu item (see Figure 316), pressing the RIGHT ARROW will display the vitrector level help screen (see Figure 317). Pressing the RIGHT ARROW button again will move past the help screen to the “Vitrector Level” command (see Figure 318). The UP ARROW and DOWN ARROW buttons are used to increase and decrease the vitrector prime vacuum level. Pressing the *Enter* button will save the displayed value in the active configuration and exit the vitrector level command. Pressing the LEFT ARROW will discard any changes made and restore the vitrector prime vacuum level to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the vitrector prime vacuum level is 400 mmHg.

CURRENT SETTINGS

```
Prime Mode Select →  
Vitrector Duration  
Vitrector Level  
Vitrector Cut Time  
Ultrasound Duration  
Ultrasound Level  
Auto Tune Is Enabled$
```

Figure 316

```
Vitrector Level  
  
This command can be  
used to change the  
aspiration level  
used to prime the  
vitrector.  
→ to continue
```

Figure 317

```
Vitrector Level  
  
400 mmHg  
  
↑↓ to change value  
ENTER to save & exit  
← to quit (no save)  
DISPLAY to exit menu
```

Figure 318

VITRECTOR CUT TIME

The vitrector cut time parameter will specify the length of time the vitrector will cut during a timed primed cycle. With the cursor on the “Vitrector Cut Time” menu item (see Figure 319), pressing the RIGHT ARROW will display the vitrector cut time help screen (see Figure 320). Pressing the RIGHT ARROW button again will move past the help screen to the “Vitrector Cut Time” command (see Figure 321). The time is specified in minutes and seconds. The LEFT ARROW and RIGHT ARROW buttons will move the cursor between the minutes and seconds values. The minutes value is on the left and the seconds is on the right. The UP ARROW and DOWN ARROW buttons are used to increase and decrease the time. Pressing the *Enter* button will save the displayed value in the active configuration and exit the vitrector cut time command. Pressing the LEFT ARROW, with the cursor under the left most field, will discard any changes made and restore the vitrector cut time to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the vitrector cut time is 10 seconds. The maximum value for the vitrector cut time is 4 minutes and 59 seconds.

CURRENT SETTINGS

```
Vitrector Duration
Vitrector Level
Vitrector Cut Time
Ultrasound Duration
Ultrasound Level
Auto Tune Is Enabled$
```

Figure 319

```
Vitrector Cut Time

This command can be
used to change the
time the vitrector
will run when prime
is initiated while
the vitrector on.
→ to continue
```

Figure 320

```
Vitrector Cut Time

00:10
—

→ move to next field
↑↓ to change value
ENTER to save & exit
← to quit (no save)
DISPLAY to exit menu
```

Figure 321

ULTRASOUND DURATION

The ultrasound duration parameter will specify the length of time the timed prime cycle will run for the ultrasound. With the cursor on the “Ultrasound Duration” menu item (see Figure 322), pressing the RIGHT ARROW will display the ultrasound duration help screen (see Figure 323). Pressing the RIGHT ARROW button again will move past the help screen to the “Ultrasound Duration” command (see Figure 324). The time is specified in minutes and seconds. The LEFT ARROW and RIGHT ARROW buttons will move the cursor between the minutes and seconds values. The minutes value is on the left and the seconds is on the right. The UP ARROW and DOWN ARROW buttons are used to increase and decrease the time. Pressing the *Enter* button will save the displayed value in the active configuration and exit the ultrasound duration command. Pressing the LEFT ARROW, with the cursor under the left most field, will discard any changes made and restore the ultrasound duration to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the ultrasound duration parameter is 4 seconds. The maximum value for the ultrasound duration is 4 minutes and 59 seconds.

```
Vitrector Level
Vitrector Cut Time
Ultrasound Duration
Ultrasound Level
Auto Tune Is Enabled$
```

Figure 322

```
Ultrasound Duration

This command can be
used to change the
time aspiration
will run when prime
is initiated while
the ultrasound on.
→ to continue
```

Figure 323

```
Ultrasound Duration

00:04
—

→ move to next field
↑↓ to change value
ENTER to save & exit
← to quit (no save)
DISPLAY to exit menu
```

Figure 324

CURRENT SETTINGS

ULTRASOUND LEVEL

The ultrasound level command can be used to set the ultrasound prime vacuum level. With the cursor on the “Ultrasound Level” menu item (see Figure 325), pressing the RIGHT ARROW will display the ultrasound level help screen (see Figure 326). Pressing the RIGHT ARROW button again will move past the help screen to the “Ultrasound Level” command (see Figure 327). The UP ARROW and DOWN ARROW buttons are used to increase and decrease the ultrasound prime vacuum level. Pressing the *Enter* button will save the displayed value in the active configuration and exit the ultrasound level command. Pressing the LEFT ARROW will discard any changes made and restore the ultrasound prime vacuum level to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the ultrasound prime vacuum level is 200 mmHg.

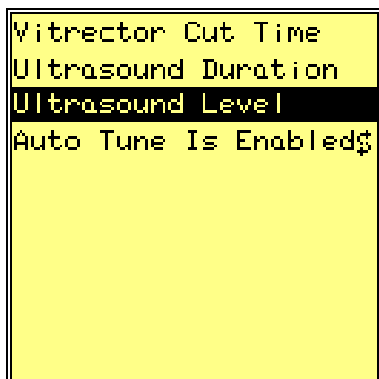


Figure 325

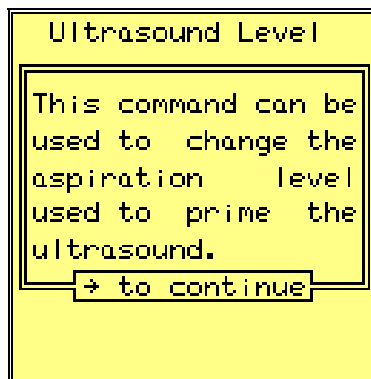


Figure 326

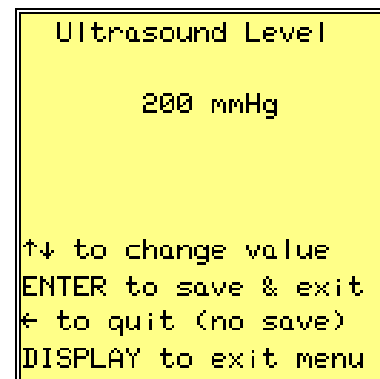


Figure 327

AUTO TUNE IS ENABLED/AUTO TUNE DISABLED

This menu item can be used to enable or disable ultrasound auto tune. With the cursor on the “Auto Tune Is Enabled” menu item (see Figure 328), pressing the *Enter* button will change the menu item to “Auto Tune Disabled”. Likewise, with the cursor on the “Auto Tune Disabled” menu item (see Figure 329), pressing the *Enter* button will change the menu item to “Auto Tune Is Enabled”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. When auto tune is enabled, if the ultrasound surgical function is enabled, the ultrasound handpiece will be tuned at the completion of the prime cycle. If auto tune is disabled, no tuning cycle will be run. The factory default has the ultrasound auto tune enabled.

CURRENT SETTINGS

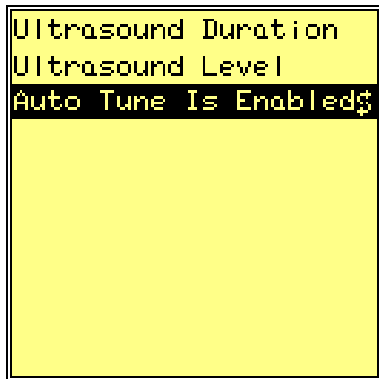


Figure 328

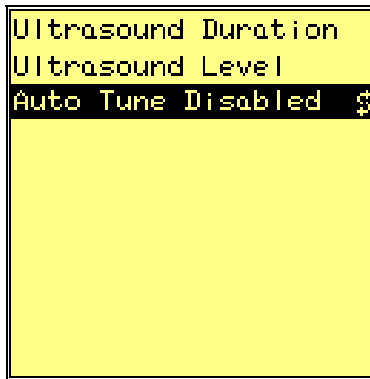


Figure 329

LOAD FACTORY DEFAULTS

The load factory defaults command will load the factory defaults for all of the parameters adjustable in the current settings menu. With the cursor on the “Load Factory Defaults” menu item (see Figure 330), pressing the RIGHT ARROW will display the load current defaults help screen (see Figure 331). Pressing the RIGHT ARROW button will move past the help screen to the “Load Current Defaults” command (see Figure 333). Pressing the LEFT ARROW will terminate the load current defaults command. Pressing the *Enter* button will load the factory defaults for the current settings area. Note that the effect on active surgical functions is immediate. Once the defaults are loaded, the *Enter* button will need to be pressed again (see Figure 334). To exit the utilities menu, press the *Display* button. If the load current settings defaults command is selected while any surgical functions are active, a warning screen will appear (see Figure 332) and a warning tone will sound.

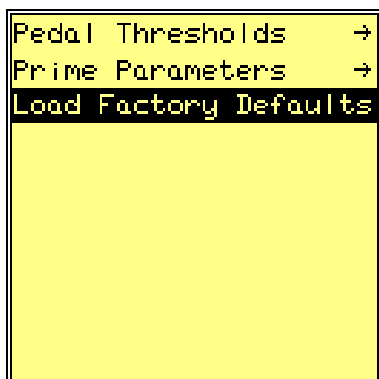


Figure 330

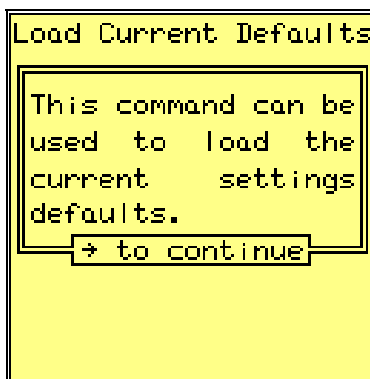


Figure 331

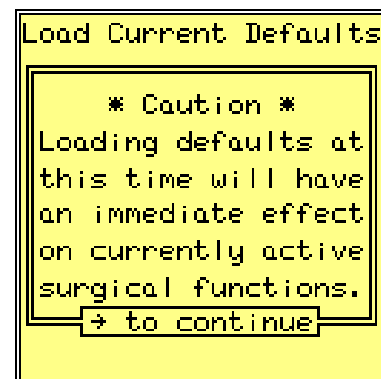


Figure 332

CURRENT SETTINGS

Load Current Defaults

0 100

0%

ENTER to load
← to quit (no load)
DISPLAY to exit menu

Figure 333

Load Current Defaults

Press ENTER to exit

0 100

100%

ENTER to exit
DISPLAY to exit menu

Figure 334

DISPLAY

The display menu has items used to control the visual aspects of the Syntec VitMan. With the cursor on the “Display” menu item (see Figure 335), pressing the RIGHT ARROW button will display the display menu help screen (see Figure 336). This help screen indicates that a toggle entry is present in the display menu list. A menu item that ends with the double arrow character will toggle between two values when the *Enter* button is pressed. Pressing the RIGHT ARROW button will move past the help screen to the display menu list (see Figure 337). At the top of the display, the text *Display* indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position. To exit the utilities menu, press the *Display* button. Changes made in the display menu are saved in the active configuration.

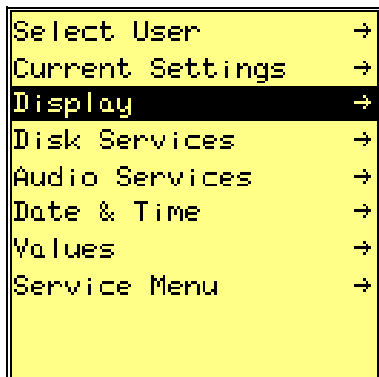


Figure 335

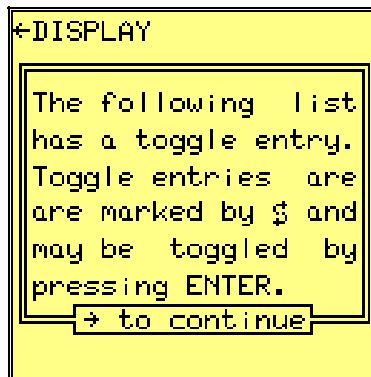


Figure 336

NORMAL VIDEO MODE/INVERSE VIDEO MODE

This menu item can be used to select the current video mode. With the cursor on the “Normal Video Mode” menu item (see Figure 337), pressing the *Enter* button will change the menu item to “Inverse Video Mode”. Likewise, with the cursor on the “Inverse Video Mode” menu item (see Figure 338), pressing the *Enter* button will change the menu item to “Normal Video Mode”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. In normal video mode, the foreground pixels are dark and the background pixels are light. In inverse video mode the foreground pixels are light and the background pixels are dark. The factory default is normal video mode.

DISPLAY

```
←DISPLAY
Normal Video Mode $
Backlight →
Contrast
LED Intensity
Cassette Illumination
Cassette Icon Is On $
Cutter Icon Is On $
Temp Messages Are On$
```

Figure 337

```
←DISPLAY
Inverse Video Mode $
Backlight →
Contrast
LED Intensity
Cassette Illumination
Cassette Icon Is On $
Cutter Icon Is On $
Temp Messages Are On$
```

Figure 338

BACKLIGHT

The backlight menu has items used to control the LCD backlight. With the cursor on the “Backlight” menu item (see Figure 339), pressing the RIGHT ARROW button will display the backlight menu help screen (see Figure 340). This help screen indicates that a toggle entry is present in the backlight menu list. A menu item that ends with the double arrow character will toggle between two values when the *Enter* button is pressed. Pressing the RIGHT ARROW button will move past the help screen to the backlight menu list (see Figure 341). At the top of the display, the text BACKLIGHT indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position. To exit the utilities menu, press the *Display* button.

```
Normal Video Mode $
Backlight →
Contrast
LED Intensity
Cassette Illumination
Cassette Icon Is On $
Cutter Icon Is On $
Temp Messages Are On$
Status Line Default →
```

Figure 339

```
←BACKLIGHT

The following list
has a toggle entry.
Toggle entries are
are marked by $ and
may be toggled by
pressing ENTER.
→ to continue
```

Figure 340

```
←BACKLIGHT
Backlight Intensity
Backlight Is On $
```

Figure 341

DISPLAY

BACKLIGHT INTENSITY

The backlight intensity command can be used to set the LCD backlight intensity. With the cursor on the “Backlight Intensity” menu item (see Figure 341), pressing the RIGHT ARROW will display the backlight intensity help screen (see Figure 342). Pressing the RIGHT ARROW button again will move past the help screen to the “Backlight Intensity” command (see Figure 343). The UP ARROW and DOWN ARROW buttons are used to increase and decrease the backlight intensity. Pressing the *Enter* button will save the displayed value in the active configuration and exit the backlight intensity command. Pressing the LEFT ARROW will discard any changes made and restore the LCD backlight intensity to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the LCD backlight intensity is 100%.

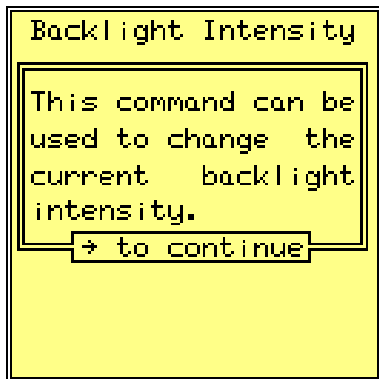


Figure 342

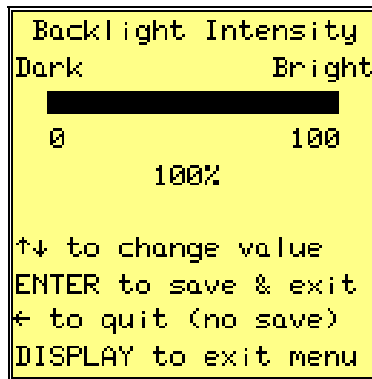


Figure 343

BACKLIGHT IS ON/BACKLIGHT IS OFF

This menu item allows the backlight to be enabled or disabled. With the cursor on the “Backlight Is On” menu item (see Figure 344), pressing the *Enter* button will change the menu item to “Backlight Is Off”. Likewise, with the cursor on the “Backlight Is Off” menu item (see Figure 345), pressing the *Enter* button will change the menu item to “Backlight Is On”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. When the backlight is on, the LCD display can be read in low ambient light levels. When the backlight is off, sufficient ambient light level is required to read the LCD display. The factory default has the backlight on.

DISPLAY

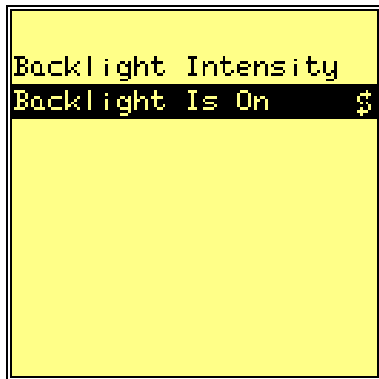


Figure 344

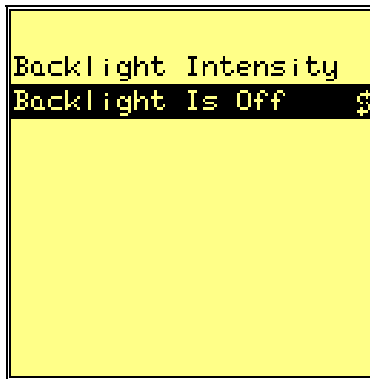


Figure 345

CONTRAST

The contrast command can be used to adjust the LCD contrast. With the cursor on the “Contrast” menu item (see Figure 346), pressing the RIGHT ARROW will display the contrast help screen (see Figure 347). Pressing the RIGHT ARROW button again will move past the help screen to the “Contrast” command (see Figure 348). The UP ARROW and DOWN ARROW buttons are used to increase and decrease the contrast level. Pressing the *Enter* button will save the displayed value in the active configuration and exit the contrast command. Pressing the LEFT ARROW will discard any changes made and restore the LCD contrast to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the contrast level is 50%.

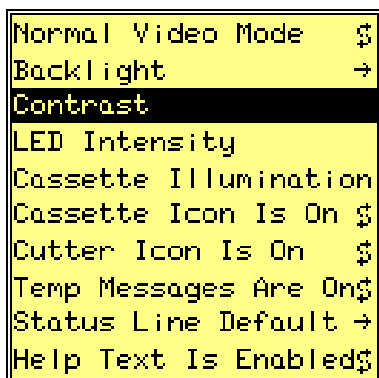


Figure 346

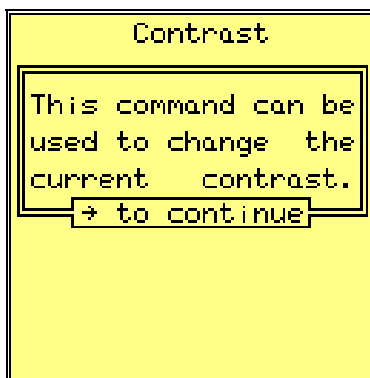


Figure 347

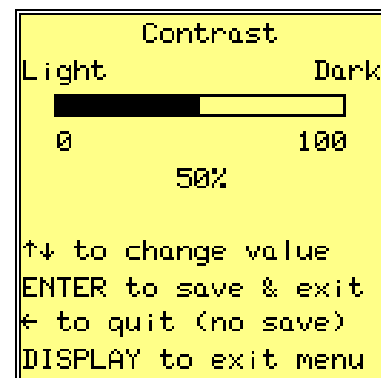


Figure 348

DISPLAY

LED INTENSITY

The LED intensity command can be used to adjust the surgical function LED intensity. With the cursor on the “LED Intensity” menu item (see Figure 349), pressing the RIGHT ARROW will display the LED intensity help screen (see Figure 350). Pressing the RIGHT ARROW button again will move past the help screen to the “LED Intensity” command (see Figure 351). The UP ARROW and DOWN ARROW buttons are used to increase and decrease the LED intensity level. Pressing the *Enter* button will save the displayed value in the active configuration and exit the LED intensity command. Pressing the LEFT ARROW will discard any changes made and restore the LED intensity to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the LED intensity is 50%.

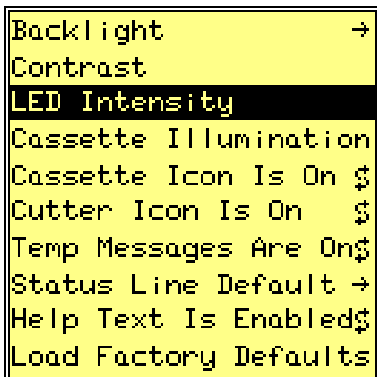


Figure 349

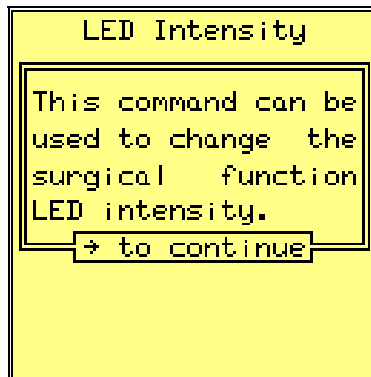


Figure 350

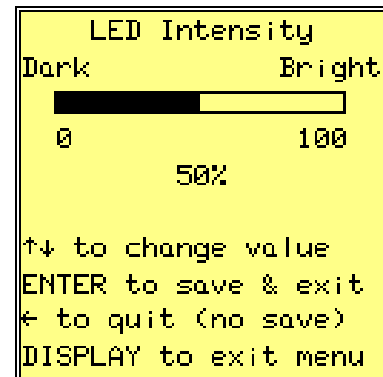


Figure 351

CASSETTE ILLUMINATION

The cassette illumination command can be used to adjust the aspiration cassette illumination intensity. With the cursor on the “Cassette Illumination” menu item (see Figure 352), pressing the RIGHT ARROW will display the cassette illumination help screen (see Figure 353). Pressing the RIGHT ARROW button again will move past the help screen to the “Cassette Illumination” command (see Figure 354). The UP ARROW and DOWN ARROW buttons are used to increase and decrease the cassette illumination intensity. Pressing the *Enter* button will save the displayed value in the active configuration and exit the cassette illumination command. Pressing the LEFT ARROW will discard any changes made and restore the cassette illumination intensity to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the cassette illumination is 50%.

DISPLAY

```

Contrast
LED Intensity
Cassette Illumination
Cassette Icon Is On $
Cutter Icon Is On  $
Temp Messages Are On$
Status Line Default →
Help Text Is Enabled$
Load Factory Defaults
  
```

Figure 352

```

Cassette Illumination
This command can be
used to change the
cassette lighting
level.
→ to continue
  
```

Figure 353

```

Cassette Illumination
Dark                      Bright
██████████              ██████████
0                        100
                        50%
↑↓ to change value
ENTER to save & exit
← to quit (no save)
DISPLAY to exit menu
  
```

Figure 354

CASSETTE ICON IS ON/CASSETTE ICON IS OFF

This menu item allows the cassette icon to be enabled or disabled. With the cursor on the “Cassette Icon Is On” menu item (see Figure 355), pressing the *Enter* button will change the menu item to “Cassette Icon Is Off”. Likewise, with the cursor on the “Cassette Icon Is Off” menu item (see Figure 356), pressing the *Enter* button will change the menu item to “Cassette Icon Is On”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. The cassette icon can be used to show the current cassette level. The factory default has the cassette icon on.

```

LED Intensity
Cassette Illumination
Cassette Icon Is On $
Cutter Icon Is On  $
Temp Messages Are On$
Status Line Default →
Help Text Is Enabled$
Load Factory Defaults
  
```

Figure 355

```

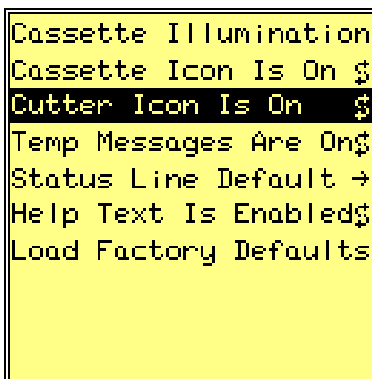
LED Intensity
Cassette Illumination
Cassette Icon Is Off$
Cutter Icon Is On  $
Temp Messages Are On$
Status Line Default →
Help Text Is Enabled$
Load Factory Defaults
  
```

Figure 356

DISPLAY

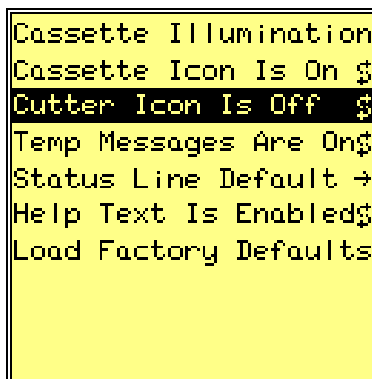
CUTTER ICON IS ON/CUTTER ICON IS OFF

This menu item can be used to enable or disable the cutter icon. With the cursor on the “Cutter Icon Is On” menu item (see Figure 357), pressing the *Enter* button will change the menu item to “Cutter Icon Is Off”. Likewise, with the cursor on the “Cutter Icon Is Off” menu item (see Figure 358), pressing the *Enter* button will change the menu item to “Cutter Icon Is On”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. The cutter icon is a visual indication of the vitrector cut enable foot pedal switch. If the foot pedal switch is in a state that allows the vitrector to cut, the icon will be displayed. The icon will also show activity while the vitrector is cutting. The factory default has the cutter icon on.



```
Cassette Illumination
Cassette Icon Is On $
Cutter Icon Is On  $
Temp Messages Are On$
Status Line Default →
Help Text Is Enabled$
Load Factory Defaults
```

Figure 357



```
Cassette Illumination
Cassette Icon Is On $
Cutter Icon Is Off  $
Temp Messages Are On$
Status Line Default →
Help Text Is Enabled$
Load Factory Defaults
```

Figure 358

TEMP MESSAGES ARE ON/TEMP MESSAGE IS OFF

This menu item can be used to enable or disable the temperature warning messages. With the cursor on the “Temp Messages Are On” menu item (see Figure 359), pressing the *Enter* button will change the menu item to “Temp Message Is Off”. Likewise, with the cursor on the “Temp Message Is Off” menu item (see Figure 360), pressing the *Enter* button will change the menu item to “Temp Messages Are On”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. The Syntec VitMan can monitor its internal temperature. If the internal temperature exceeds 55 °C, a warning message will be generated. If the temperature falls below 10 °C, a warning message will be generated. The factory default has the temperature messages on.

DISPLAY

```
Cassette Icon Is On $
Cutter Icon Is On   $
Temp Messages Are On$
Status Line Default →
Help Text Is Enabled$
Load Factory Defaults
```

Figure 359

```
Cassette Icon Is On $
Cutter Icon Is On   $
Temp Message Is Off $
Status Line Default →
Help Text Is Enabled$
Load Factory Defaults
```

Figure 360

STATUS LINE DEFAULT

The status line default command can be used to select the status line default text. Three options are available. When no status messages are present, the status line may be left blank. The status line can display the current date and time, or the active configuration user name. With the cursor on the “Status Line Default” menu item (see Figure 361), pressing the RIGHT ARROW will display the status line default help screen (see Figure 362). This help screen describes how to select an item from a list. Pressing the RIGHT ARROW button again will move past the help screen to the “Status Line Default” list (see Figure 363). The currently selected item is marked with an asterisk. Using the UP ARROW and DOWN ARROW buttons, move the cursor to the desired item and press *Enter*. The asterisk will move to the newly selected item. To exit this list press the LEFT ARROW button. To exit the utilities menu, press the *Display* button. The factory default for the status line default text is the date & time.

```
Cutter Icon Is On   $
Temp Messages Are On$
Status Line Default →
Help Text Is Enabled$
Load Factory Defaults
```

Figure 361

```
←STATUS LINE DEFAULT

To select an item
from the following
list, move the bar
to the desired item
and press ENTER.
The * will move to
the selected item.

→ to continue
```

Figure 362

```
←STATUS LINE DEFAULT
Date & Time      *
User Name
Blank
```

Figure 363

DISPLAY

HELP TEXT IS ENABLED/HELP TEXT DISABLED

This menu item can be used to enable or disable the help screens. With the cursor on the “Help Text Is Enabled” menu item (see Figure 364), pressing the *Enter* button will change the menu item to “Help Text Is Disabled”. Likewise, with the cursor on the “Help Text Is Disabled” menu item (see Figure 365), pressing the *Enter* button will change the menu item to “Help Text Is Enabled”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. When the help text is enabled, actions where help text is present will display the help text. If the help text is disabled, only the main menu help screen and warning screens will be displayed. The factory default for the help text is enabled.

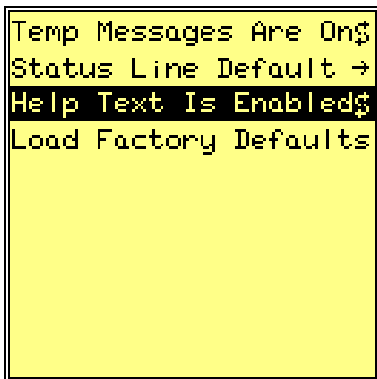


Figure 364

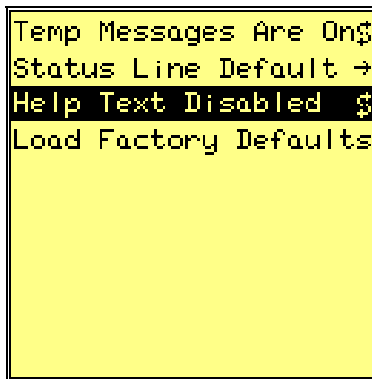


Figure 365

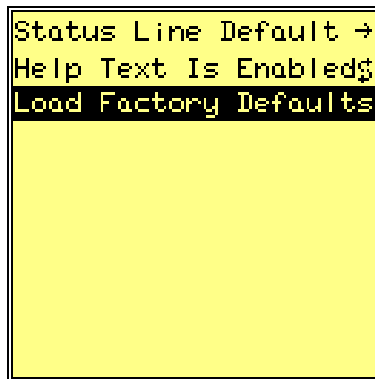


Figure 366

LOAD FACTORY DEFAULTS

The load factory defaults command will load the factory defaults for all of the parameters adjustable in the display menu. With the cursor on the “Load Factory Defaults” menu item (see Figure 366), pressing the RIGHT ARROW will display the load display defaults help screen (see Figure 367). Pressing the RIGHT ARROW button will move past the help screen to the “Load Display Defaults” command (see Figure 368). Pressing the LEFT ARROW will terminate the load display defaults command. Pressing the *Enter* button will load the factory defaults for the display area. Once the defaults are loaded, the *Enter* button will need to be pressed again (see Figure 369). To exit the utilities menu, press the *Display* button.

DISPLAY

Load Display Defaults

This command can be
used to load the
display defaults.

→ to continue

Figure 367

Load Display Defaults

0100

0%

ENTER to load
← to quit (no load)
DISPLAY to exit menu

Figure 368

Load Display Defaults

Press ENTER to exit

0100

100%

ENTER to exit
DISPLAY to exit menu

Figure 369

DISK SERVICES

DISK SERVICES

The disk services menu has items used to access the floppy disk drive. With the cursor on the “Disk Services” menu item (see Figure 370), pressing the RIGHT ARROW button will display the disk services help screen (see Figure 371). Pressing the RIGHT ARROW button again will move past the help screen to the disk services menu list (see Figure 372). At the top of the display, the text DISK SERVICES indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position. Changes made in the disk services menu are saved in the active configuration.

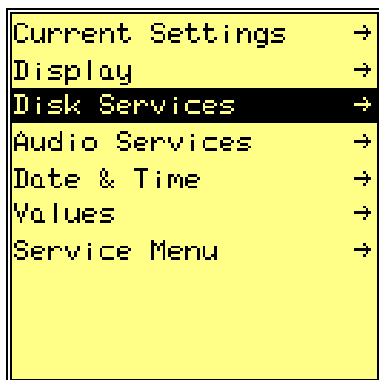


Figure 370

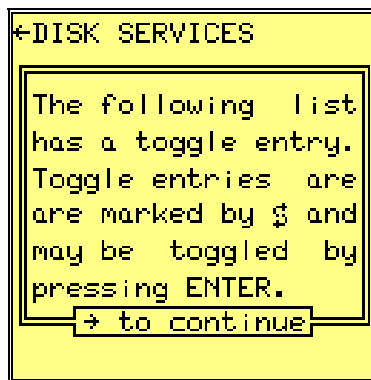


Figure 371



Figure 372

DISK DIRECTORY

The disk directory command will display the directory of the floppy disk. With the cursor on the “Disk Directory” menu item (see Figure 372), pressing the RIGHT ARROW will display the disk directory help screen (see Figure 373). Pressing the RIGHT ARROW button again will move past the help screen to the “Disk Directory” display (see Figure 374). The file name and date of the files present on the disk will be displayed. Pressing the RIGHT ARROW button again will change the date of the file to the time (see Figure 375). Pressing the RIGHT ARROW button again will change the time on the file to the size of the file (see Figure 376). Each time the RIGHT ARROW is pressed, the column following the file name will cycle from the date, to the time, to the size. The UP ARROW and DOWN ARROW buttons can be used to scroll through the directory. To read another disk or re-read the current directory, press the *Enter* button. To exit, press the LEFT ARROW button. To exit the utilities menu, press the *Display* button.

DISK SERVICES

Several error conditions will be displayed when appropriate. If the disk is missing, the message “No diskette present” will be displayed. If the disk directory is unreadable, the message “Diskette problem” will be displayed. If the directory is empty, only the title line will be displayed. Note that only files in the root directory will be displayed.



Figure 373

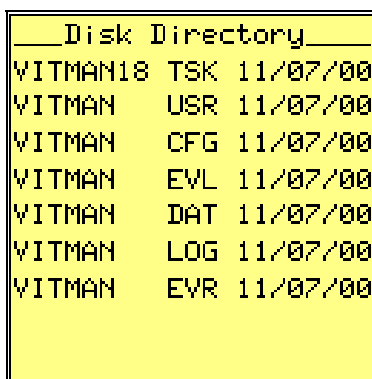


Figure 374

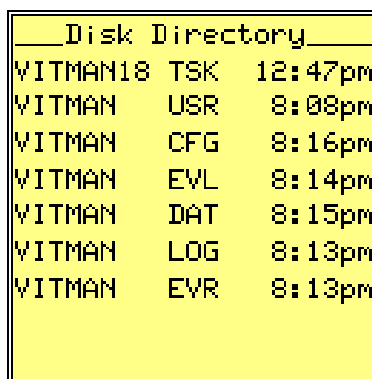


Figure 375

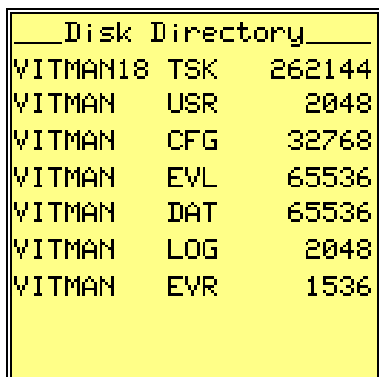


Figure 376

COMPRESSED DATA LOG/LINEAR DATA LOG

This menu item can be used to select the type of data log created. With the cursor on the “Compressed Data Log” menu item (see Figure 377), pressing the *Enter* button will change the menu item to “Linear Data Log”. Likewise, with the cursor on the “Linear Data Log” menu item (see Figure 378), pressing the *Enter* button will change the menu item to “Compressed Data Log”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. When the compressed data log is selected, if no changes in the recorded device data is detected, the size of the recorded device data file is reduced. If the linear data log is selected, all recorded device data is saved on the disk. In the linear

DISK SERVICES

data log mode the maximum record time on a blank diskette is approximately 8 hours. The factory default is the compressed data log.

```
Disk Directory
Compressed Data Log $
Event Log Record On $
Log Wrap Disabled $
Clear Device Log
Format Disk
Save Software
Save Active User
Save All Users
```

Figure 377

```
Disk Directory
Linear Data Log $
Event Log Record On $
Log Wrap Disabled $
Clear Device Log
Format Disk
Save Software
Save Active User
Save All Users
```

Figure 378

EVENT LOG RECORD OFF/EVENT LOG RECORD ON

This menu item can be used enable and disable the automatic recording of the event log. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. With the cursor on the “Event Log Record Off” menu item (see Figure 379), pressing the *Enter* button will change the menu item to “Event Log Record On”. Likewise, with the cursor on the “Event Log Record On” menu item (see Figure 380), pressing the *Enter* button will change the menu item to “Event Log Record Off”. When the menu item reads “Event Log Record On”, the event log will be written to the floppy disk. The event log is written once a minute, following an update to the data log. The event log consists of selected events and the date and time of their occurrence. The event log will be appended to the file VITMAN.EVR. If the file does not exist, it will be created. The factory default has event log recording on.

```
Disk Directory
Compressed Data Log $
Event Log Record Off$
Log Wrap Disabled $
Clear Device Log
Format Disk
Save Software
Save Active User
Save All Users
Save Event Log
```

Figure 379

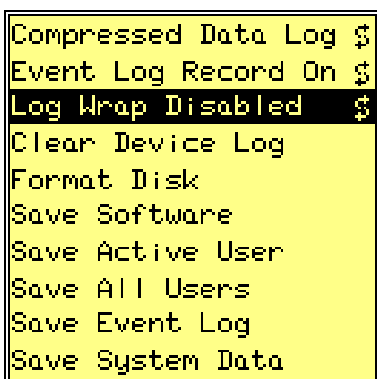
```
Disk Directory
Compressed Data Log $
Event Log Record On $
Log Wrap Disabled $
Clear Device Log
Format Disk
Save Software
Save Active User
Save All Users
Save Event Log
```

Figure 380

DISK SERVICES

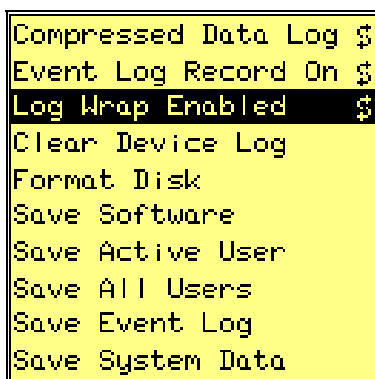
LOG WRAP DISABLED/LOG WRAP ENABLED

This menu item can be used enable and disable wrapping of the data log. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. With the cursor on the “Log Wrap Disabled” menu item (see Figure 381), pressing the *Enter* button will change the menu item to “Log Wrap Enabled”. Likewise, with the cursor on the “Log Wrap Enabled” menu item (see Figure 382), pressing the *Enter* button will change the menu item to “Log Wrap Disabled”. When the menu item reads “Log Wrap Enabled” and the disk is full, the oldest data in the data log will be discarded to make room for the new data. When the menu item reads “Log Wrap Disabled” and the disk is full, the new data will be discarded and the error message “Diskette full” will be displayed. The factory default has data log wrapping disabled.



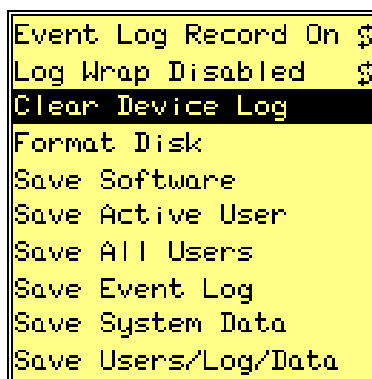
```
Compressed Data Log $
Event Log Record On $
Log Wrap Disabled $
Clear Device Log
Format Disk
Save Software
Save Active User
Save All Users
Save Event Log
Save System Data
```

Figure 381



```
Compressed Data Log $
Event Log Record On $
Log Wrap Enabled $
Clear Device Log
Format Disk
Save Software
Save Active User
Save All Users
Save Event Log
Save System Data
```

Figure 382



```
Event Log Record On $
Log Wrap Disabled $
Clear Device Log
Format Disk
Save Software
Save Active User
Save All Users
Save Event Log
Save System Data
Save Users/Log/Data
```

Figure 383

CLEAR DEVICE LOG

The clear device log command can be used to delete the device log file (VITMAN.LOG). With the cursor on the “Clear Device Log” menu item (see Figure 383), pressing the RIGHT ARROW will display the clear device log help screen (see Figure 384). Pressing the RIGHT ARROW button again will move past the help screen to the “Clear Device Log” command (see Figure 385). Pressing the *Enter* button will delete the device log file. Pressing the LEFT ARROW will exit the clear device log command. To exit the utilities menu, press the *Display* button. Once the device log is cleared, the *Enter* button will need to be pressed again (see Figure 386).

Several error conditions will be displayed when appropriate. If the disk is missing, the message “No diskette present” will be displayed. If the disk directory is unreadable, the message “Diskette problem” will be displayed. If the disk is write protected, the message “Disk write protected” will be displayed. If the file VITMAN.LOG is not present, no error message will be displayed.

DISK SERVICES



Figure 384



Figure 385

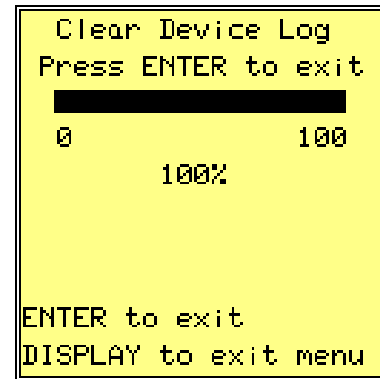


Figure 386

FORMAT DISK

The format disk command can be used to format a floppy disk. With the cursor on the “Format Disk” menu item (see Figure 387), pressing the RIGHT ARROW will display the format disk help screen (see Figure 388). Pressing the RIGHT ARROW button again will move past the help screen to the “Formatting Diskette” command (see Figure 389). Pressing the *Enter* button will start the format process. Pressing the LEFT ARROW will exit the formatting diskette command. To exit the utilities menu, press the *Display* button. Once the formatting process begins, the user may abort the process by pressing the LEFT ARROW button. However, this will leave the diskette in an unusable state. After the format is complete, the *Enter* button will need to be pressed again.

Several error conditions will be displayed when appropriate. If the disk is missing, the message “No diskette present” will be displayed. If the disk is write protected, the message “Disk write protected” will be displayed. Before the format begins, the drive is recalibrated. If recalibration is unsuccessful, the message “Recalibrate problem” will be displayed. If any track will not format, the message “Diskette problem” will be displayed and the format will terminate.

DISK SERVICES

```
Log Wrap Disabled  $
Clear Device Log
Format Disk
Save Software
Save Active User
Save All Users
Save Event Log
Save System Data
Save Users/Log/Data
Load Software
```

Figure 387

```
Formatting Diskette

This command will
format the disk.
All data on the
disk will be lost.
This will take two
minutes.
→ to continue
```

Figure 388

```
Formatting Diskette

0 100
0%

ENTER to format
← to quit (no format)
DISPLAY to exit menu
```

Figure 389

SAVE SOFTWARE

The save software command can be used to save the software on floppy disk. The software is saved in the file VITMAN.TSK. With the cursor on the “Save Software” menu item (see Figure 390), pressing the RIGHT ARROW will display the saving software help screen (see Figure 391). Pressing the RIGHT ARROW button again will move past the help screen to the “Saving Software” command (see Figure 392). Pressing the *Enter* button will start the saving software process. Pressing the LEFT ARROW will exit the saving software command. To exit the utilities menu, press the *Display* button. Once the save begins, the process may be terminated by pressing the LEFT ARROW button. After the save is complete, the *Enter* button will need to be pressed again. The save software process will delete any previously saved software file. If the save process is aborted, any previous version of the file will be lost.

Several error conditions will be displayed when appropriate. If the disk is missing, the message “No diskette present” will be displayed. If the disk directory is unreadable, the message “Diskette problem” will be displayed. If the disk is write protected, the message “Disk write protected” will be displayed. If the disk does not have sufficient space to save the entire file, the message “Insufficient space” will be displayed. If a sector will not verify, the message “Diskette problem” will be displayed.

DISK SERVICES

```
Clear Device Log
Format Disk
Save Software
Save Active User
Save All Users
Save Event Log
Save System Data
Save Users/Log/Data
Load Software
Load Active User
```

Figure 390

```
Saving Software

This command can be
used to save the
system software on
the disk. The file
VITMAN.TSK will be
created. This will
take four minutes.
→ to continue
```

Figure 391

```
Saving Software

0 100
0%

ENTER to save
← to quit (no save)
DISPLAY to exit menu
```

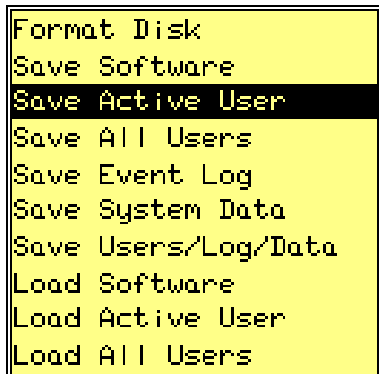
Figure 392

SAVE ACTIVE USER

The save active user command can be used to save the active configuration area on floppy disk. The active configuration is saved in the file VITMAN.USR. With the cursor on the “Save Active User” menu item (see Figure 393), pressing the RIGHT ARROW will display the saving active user help screen (see Figure 394). Pressing the RIGHT ARROW button again will move past the help screen to the “Saving Active User” command (see Figure 395). Pressing the *Enter* button will start the saving active user process. Pressing the LEFT ARROW will exit the saving active user command. To exit the utilities menu, press the *Display* button. Once the save begins, the process may be terminated by pressing the LEFT ARROW button. After the save is complete, the *Enter* button will need to be pressed again. The save active user process will delete any previously saved active user file. If the save process is aborted, any previous version of the file will be lost.

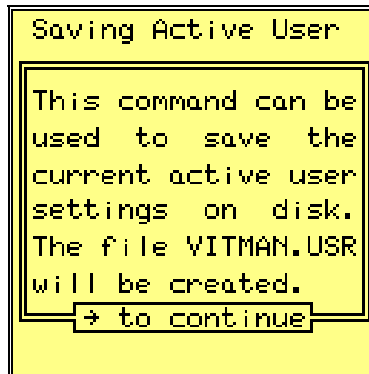
Several error conditions will be displayed when appropriate. If the disk is missing, the message “No diskette present” will be displayed. If the disk directory is unreadable, the message “Diskette problem” will be displayed. If the disk is write protected, the message “Disk write protected” will be displayed. If the disk does not have sufficient space to save the entire file, the message “Insufficient space” will be displayed. If a sector will not verify, the message “Diskette problem” will be displayed.

DISK SERVICES



```
Format Disk
Save Software
Save Active User
Save All Users
Save Event Log
Save System Data
Save Users/Log/Data
Load Software
Load Active User
Load All Users
```

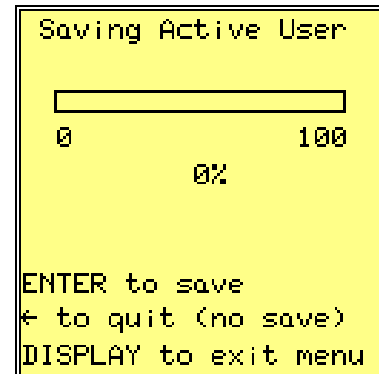
Figure 393



```
Saving Active User

This command can be
used to save the
current active user
settings on disk.
The file VITMAN.USR
will be created.
→ to continue
```

Figure 394



```
Saving Active User

0 100
0%

ENTER to save
← to quit (no save)
DISPLAY to exit menu
```

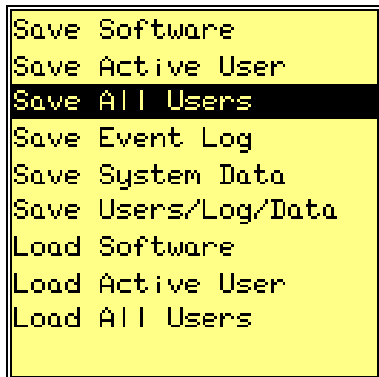
Figure 395

SAVE ALL USERS

The save all users command can be used to save the entire configuration area on floppy disk. The configuration area is saved in the file VITMAN.CFG. With the cursor on the “Save All Users” menu item (see Figure 396), pressing the RIGHT ARROW will display the saving all users help screen (see Figure 397). Pressing the RIGHT ARROW button again will move past the help screen to the “Saving All Users” command (see Figure 398). Pressing the *Enter* button will start the saving all users process. Pressing the LEFT ARROW will exit the saving all users command. To exit the utilities menu, press the *Display* button. Once the save begins, the process may be terminated by pressing the LEFT ARROW button. After the save is complete, the *Enter* button will need to be pressed again. The save all users process will delete any previously saved users file. If the save process is aborted, any previous version of the file will be lost.

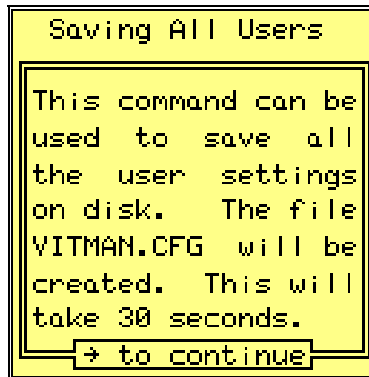
Several error conditions will be displayed when appropriate. If the disk is missing, the message “No diskette present” will be displayed. If the disk directory is unreadable, the message “Diskette problem” will be displayed. If the disk is write protected, the message “Disk write protected” will be displayed. If the disk does not have sufficient space to save the entire file, the message “Insufficient space” will be displayed. If a sector will not verify, the message “Diskette problem” will be displayed.

DISK SERVICES



```
Save Software
Save Active User
Save All Users
Save Event Log
Save System Data
Save Users/Log/Data
Load Software
Load Active User
Load All Users
```

Figure 396

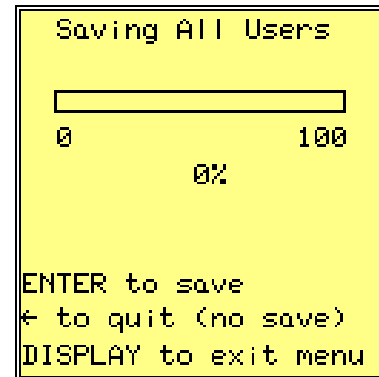


```
Saving All Users

This command can be
used to save all
the user settings
on disk. The file
VITMAN.CFG will be
created. This will
take 30 seconds.

→ to continue
```

Figure 397



```
Saving All Users

0 100
0%

ENTER to save
← to quit (no save)
DISPLAY to exit menu
```

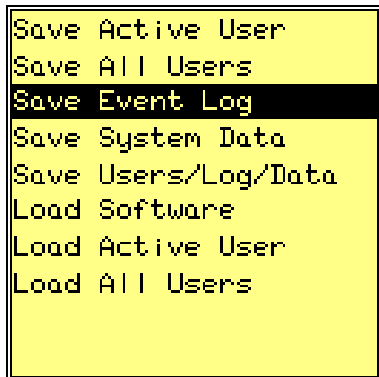
Figure 398

SAVE EVENT LOG

The save event log command can be used to save the event log on a floppy disk. The event log is saved in the file VITMAN.EVL. With the cursor on the “Save Event Log” menu item (see Figure 399), pressing the RIGHT ARROW will display the saving event log help screen (see Figure 400). Pressing the RIGHT ARROW button again will move past the help screen to the “Saving Event Log” command (see Figure 401). Pressing the *Enter* button will start the saving event log process. Pressing the LEFT ARROW will exit the saving event log command. To exit the utilities menu, press the *Display* button. Once the save begins, the process may be terminated by pressing the LEFT ARROW button. After the save is complete, the *Enter* button will need to be pressed again. The save event log process will delete any previously saved event log file. If the save process is aborted, any previous version of the file will be lost.

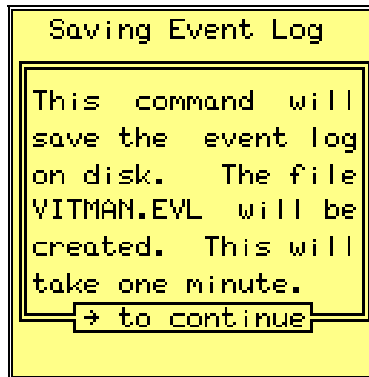
Several error conditions will be displayed when appropriate. If the disk is missing, the message “No diskette present” will be displayed. If the disk directory is unreadable, the message “Diskette problem” will be displayed. If the disk is write protected, the message “Disk write protected” will be displayed. If the disk does not have sufficient space to save the entire file, the message “Insufficient space” will be displayed. If a sector will not verify, the message “Diskette problem” will be displayed.

DISK SERVICES



```
Save Active User
Save All Users
Save Event Log
Save System Data
Save Users/Log/Data
Load Software
Load Active User
Load All Users
```

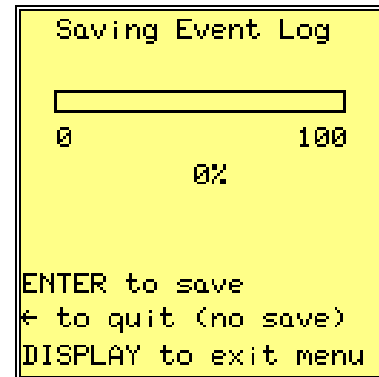
Figure 399



```
Saving Event Log

This command will
save the event log
on disk. The file
VITMAN.EVL will be
created. This will
take one minute.
→ to continue
```

Figure 400



```
Saving Event Log

0 100
0%

ENTER to save
← to quit (no save)
DISPLAY to exit menu
```

Figure 401

SAVE SYSTEM DATA

The save system data command can be used to save the system data on a floppy disk. The system data is saved in the file VITMAN.DAT. With the cursor on the “Save System Data” menu item (see Figure 402), pressing the RIGHT ARROW will display the saving system data help screen (see Figure 403). Pressing the RIGHT ARROW button again will move past the help screen to the “Saving System Data” command (see Figure 404). Pressing the *Enter* button will start the saving system data process. Pressing the LEFT ARROW will exit the saving system data command. To exit the utilities menu, press the *Display* button. Once the save begins, the process may be terminated by pressing the LEFT ARROW button. After the save is complete, the *Enter* button will need to be pressed again. The save system data process will delete any previously saved system data file. If the save process is aborted, any previous version of the file will be lost.

Several error conditions will be displayed when appropriate. If the disk is missing, the message “No diskette present” will be displayed. If the disk directory is unreadable, the message “Diskette problem” will be displayed. If the disk is write protected, the message “Disk write protected” will be displayed. If the disk does not have sufficient space to save the entire file, the message “Insufficient space” will be displayed. If a sector will not verify, the message “Diskette problem” will be displayed.

DISK SERVICES

```
Save All Users
Save Event Log
Save System Data
Save Users/Log/Data
Load Software
Load Active User
Load All Users
```

Figure 402

```
Saving System Data

This command will
save the system
data on the disk.
The file VITMAN.DAT
will be created.
This will take one
minute.
→ to continue
```

Figure 403

```
Saving System Data

0 100
0%

ENTER to save
← to quit (no save)
DISPLAY to exit menu
```

Figure 404

SAVE USERS/LOG/DATA

The save users/log/data command can be used to save the entire configuration data, the event log and the system data on a floppy disk. The configuration area is saved in the file VITMAN.CFG. The event log is saved in the file VITMAN.EVL. The system data is saved in the file VITMAN.DAT. With the cursor on the "Save Users/Log/Data" menu item (see Figure 405), pressing the RIGHT ARROW will display the saving users/log/data help screen (see Figure 406). Pressing the RIGHT ARROW button again will move past the help screen to the "Saving Users/Log/Data" command (see Figure 407). Pressing the *Enter* button will start the saving users/log/data process. Pressing the LEFT ARROW will exit the saving users/log/data command. To exit the utilities menu, press the *Display* button. Once the save begins, each process may be terminated by pressing the LEFT ARROW button. To completely terminate the save users/log/data process, the LEFT ARROW button may need to be pressed up to three times, once for each file saved. After the save is complete, the *Enter* button will need to be pressed again. The save users/log/data process will delete any previously saved users/log/data files. If a save process is terminated, any previous version of the file being saved will be lost.

Several error conditions will be displayed when appropriate. If the disk is missing, the message "No diskette present" will be displayed. If the disk directory is unreadable, the message "Diskette problem" will be displayed. If the disk is write protected, the message "Disk write protected" will be displayed. If the disk does not have sufficient space to save the entire file, the message "Insufficient space" will be displayed. If a sector will not verify, the message "Diskette problem" will be displayed.

DISK SERVICES

```
Save Event Log
Save System Data
Save Users/Log/Data
Load Software
Load Active User
Load All Users
```

Figure 405

```
Saving Users/Log/Data

This command will
save, on the disk,
all user settings,
the event log and
the system data.
This may take three
minutes.
→ to continue
```

Figure 406

```
Saving Users/Log/Data

0 100
0%

ENTER to save
← to quit (no save)
DISPLAY to exit menu
```

Figure 407

LOAD SOFTWARE

The load software command can be used to load the software from a floppy disk. The software is found in the file VITMAN.TSK. With the cursor on the “Load Software” menu item (see Figure 408), pressing the RIGHT ARROW will display the loading software help screen (see Figure 409). Pressing the RIGHT ARROW button again will move past the help screen to the “Loading Software” command (see Figure 410). Pressing the *Enter* button will start the loading software process, if only one version of software is present on the diskette. If more than one version is present, the select file to load help screen will appear (see Figure 411). Pressing the RIGHT ARROW will move past the help screen to display a list of the available versions (see Figure 412). Using the UP ARROW and DOWN ARROW buttons, place the cursor on the version to load. Pressing the *Enter* button will start loading the software version selected. When the load begins, the file name of the selected version will be displayed on the second line of the LCD display (see Figure 413). Pressing the LEFT ARROW will exit the loading software command. To exit the utilities menu, press the *Display* button. Once the load begins, the process may be terminated by pressing the LEFT ARROW button. After the load is complete, the VitMan will reset and run the new software. If the loading software process is terminated or if an error occurs, the VitMan will not automatically reset and the reason for termination will be displayed.

Several error conditions will be displayed when appropriate. If the disk is missing, the message “No diskette present” will be displayed. If the disk directory is unreadable, the message “Diskette problem” will be displayed. If the file VITMAN.TSK is not present, the message “VITMAN.TSK not found” will be displayed. If a sector cannot be read, the message “Diskette problem” will be displayed. If the task image in the file is not appropriate for this device, the message “Invalid device type” will be displayed. If the file read does not meet the criterion for a task image, the message “Invalid task image” will be displayed. If

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the task image cannot be programmed into FLASH, the message “Program NOT loaded” will be displayed.

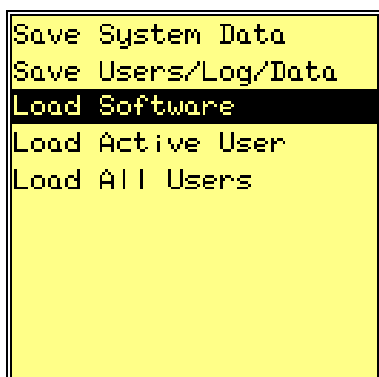


Figure 408

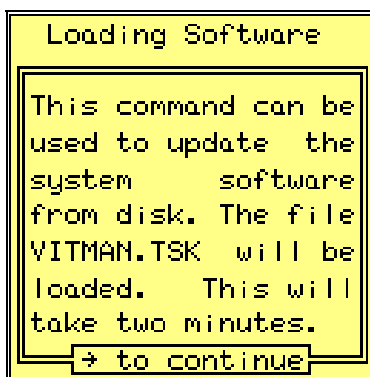


Figure 409



Figure 410

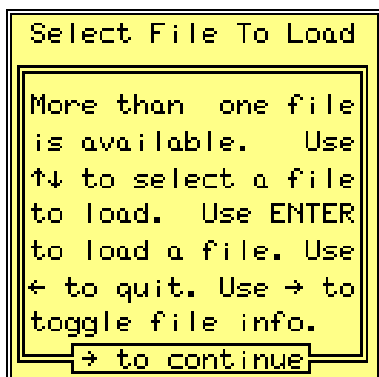


Figure 411

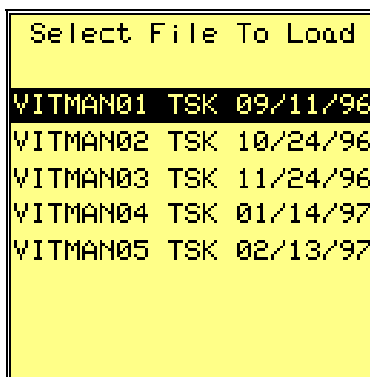


Figure 412



Figure 413

LOAD ACTIVE USER

The load active user command can be used to load the active configuration area from a floppy disk. The active configuration is loaded from the file VITMAN.USR. With the cursor on the “Load Active User” menu item (see Figure 414), pressing the RIGHT ARROW will display the loading active user help screen (see Figure 415). Pressing the RIGHT ARROW button again will move past the help screen to the “Loading Active User” command (see Figure 417). Pressing the *Enter* button will start the loading active user process, if only one active user file is present on the diskette. If more than one active user file is present, the select file to load help screen will appear (see Figure 418). Pressing the RIGHT ARROW will move past the help screen to display a list of the available active user files (see Figure 419). Using the UP ARROW and DOWN ARROW buttons, place the cursor on the file to load. Pressing the *Enter* button will start loading the active user file selected. When the load begins, the file name of the selected file will be displayed on the second line of the LCD display (see Figure 420). Pressing the

DISK SERVICES

LEFT ARROW will exit the loading active user command. To exit the utilities menu, press the *Display* button. Once the load begins, the process may be terminated by pressing the LEFT ARROW button. After the load is complete, the *Enter* button will need to be pressed again (see Figure 421). If the load active user command is selected while any surgical functions are active, a warning screen will appear (see Figure 416) and a warning tone will sound. If the loading software process is terminated or if an error occurs, the active user area will not be modified.

Several error conditions will be displayed when appropriate. If the disk is missing, the message "No diskette present" will be displayed. If the disk directory is unreadable, the message "Diskette problem" will be displayed. If the file VITMAN.USR is not present, the message "VITMAN.USR not found" will be displayed. If a sector cannot be read, the message "Diskette problem" will be displayed.

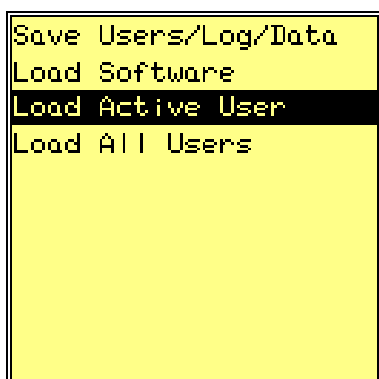


Figure 414

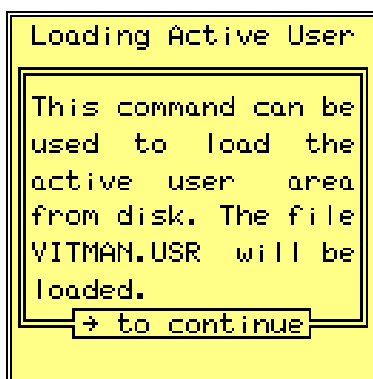


Figure 415

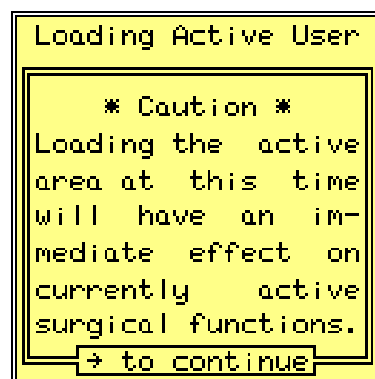


Figure 416

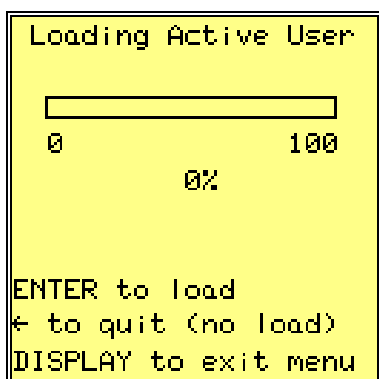


Figure 417

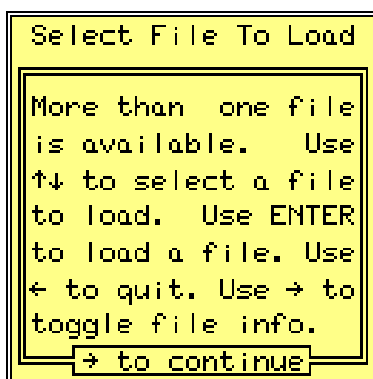


Figure 418

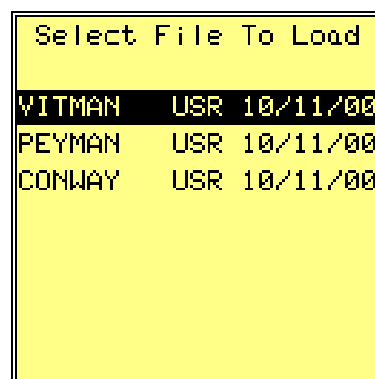


Figure 419

DISK SERVICES

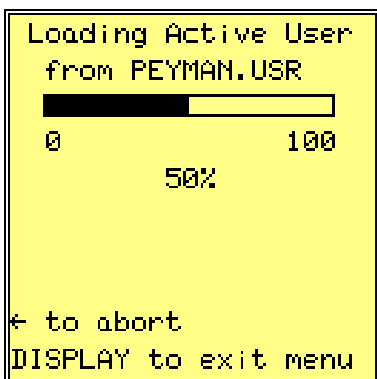


Figure 420

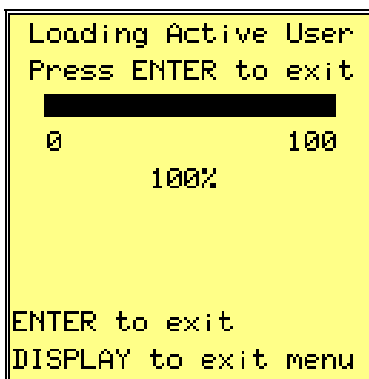


Figure 421

LOAD ALL USERS

The load all users command can be used to load the entire configuration area from a floppy disk. The configuration area is loaded from the file VITMAN.CFG. With the cursor on the “Load All Users” menu item (see Figure 422), pressing the RIGHT ARROW will display the loading all users help screen (see Figure 423). Pressing the RIGHT ARROW button again will move past the help screen to the “Loading All Users” command (see Figure 425). Pressing the *Enter* button will start the loading all users process, if only one all users file is present on the diskette. If more than one all users file is present, the select file to load help screen will appear (see Figure 426). Pressing the RIGHT ARROW will move past the help screen to display a list of the available all users files (see Figure 427). Using the UP ARROW and DOWN ARROW buttons, place the cursor on the file to load. Pressing the *Enter* button will start loading the all users file selected. When the load begins, the file name of the selected file will be displayed on the second line of the LCD display (see Figure 428). Pressing the LEFT ARROW will exit the loading all users command. To exit the utilities menu, press the *Display* button. Once the load begins, the process may be terminated by pressing the LEFT ARROW button. After the load is complete, the *Enter* button will need to be pressed again (see Figure 429). If the load active user command is selected while any surgical functions are active, a warning screen will appear (see Figure 424) and a warning tone will sound. If the loading software process is terminated or if an error occurs, the configuration area will not be modified.

Several error conditions will be displayed when appropriate. If the disk is missing, the message “No diskette present” will be displayed. If the disk directory is unreadable, the message “Diskette problem” will be displayed. If the file VITMAN.CFG is not present, the message “VITMAN.CFG not found” will be displayed. If a sector cannot be read, the message “Diskette problem” will be displayed.

DISK SERVICES

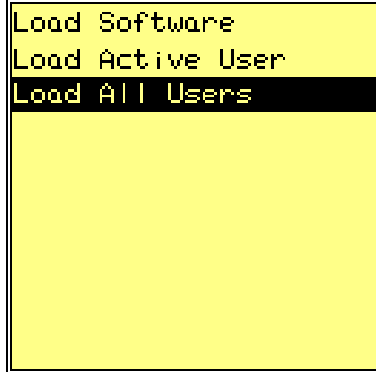


Figure 422

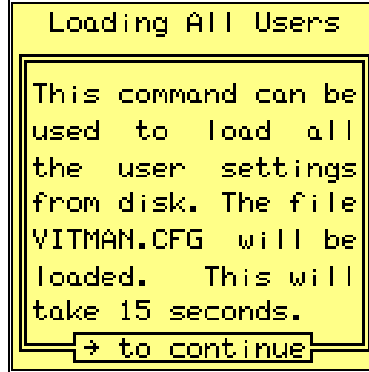


Figure 423

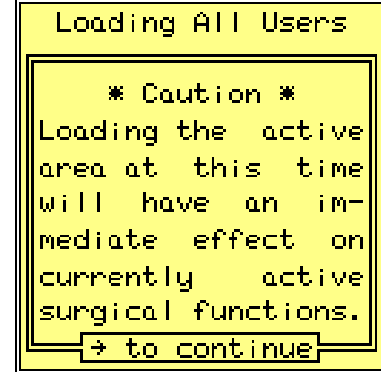


Figure 424

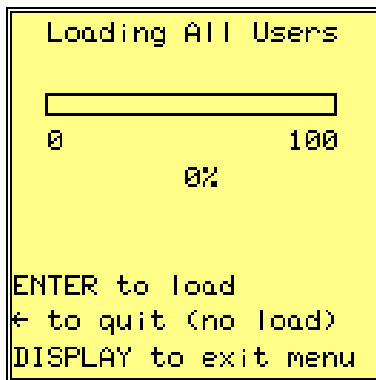


Figure 425

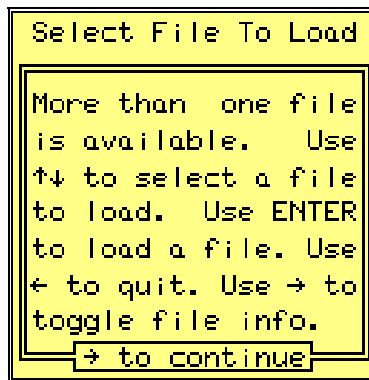


Figure 426

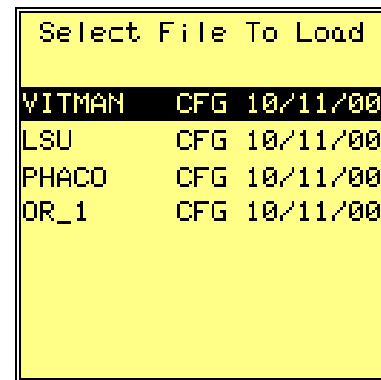


Figure 427

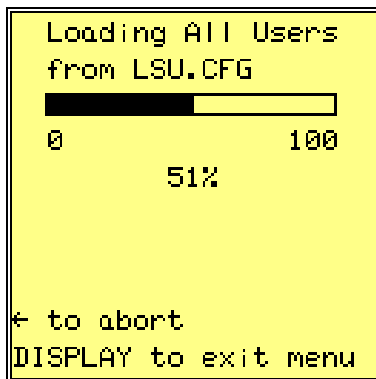


Figure 428

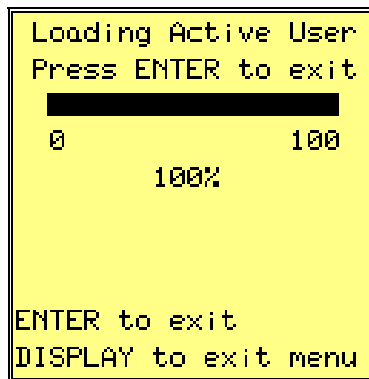


Figure 429

AUDIO SERVICES

AUDIO SERVICES

The audio services menu has items used to control the audible aspects of the Syntec VitMan. With the cursor on the “Audio Services” menu item (see Figure 430), pressing the RIGHT ARROW button will display the audio services menu help screen (see Figure 431). This help screen indicates that a toggle entry is present in the audio services menu list. A menu item that ends with the double arrow character will toggle between two values when the *Enter* button is pressed. Pressing the RIGHT ARROW button will move past the help screen to the audio services menu list (see Figure 432). At the top of the display, the text AUDIO SERVICES indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position. Changes made in the audio services menu are saved in the active configuration.

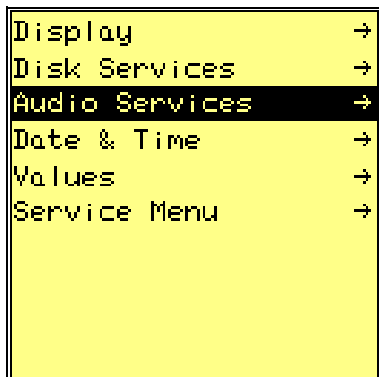


Figure 430

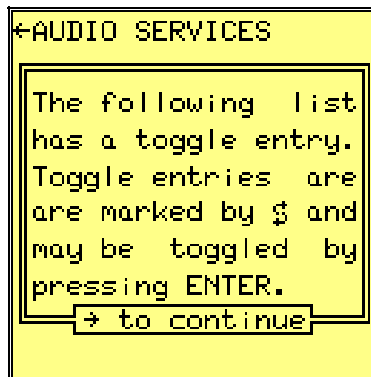


Figure 431

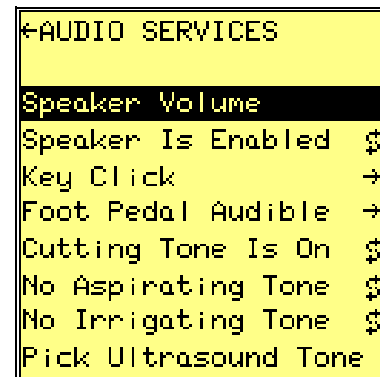


Figure 432

SPEAKER VOLUME

The speaker volume command can be used to adjust the speaker volume. With the cursor on the “Speaker Volume” menu item (see Figure 432), pressing the RIGHT ARROW will display the speaker volume help screen (see Figure 433). Pressing the RIGHT ARROW button again will move past the help screen to the “Speaker Volume” command (see Figure 434). The UP ARROW and DOWN ARROW buttons are used to increase and decrease the speaker volume. Pressing the *Enter* button will save the displayed value in the active configuration and exit the speaker volume command. Pressing the LEFT ARROW will discard any changes made and restore the speaker volume to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the speaker volume is 50%.

AUDIO SERVICES

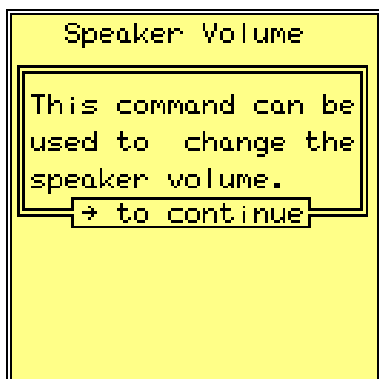


Figure 433

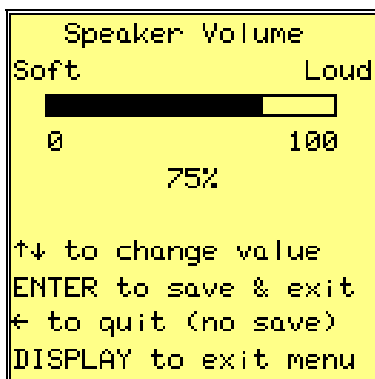


Figure 434

SPEAKER IS ENABLED/SPEAKER IS DISABLED

This menu item can be used to enable or disable the speaker. With the cursor on the "Speaker Is Enabled" menu item (see Figure 435), pressing the *Enter* button will change the menu item to "Speaker Is Disabled". Likewise, with the cursor on the "Speaker Is Disabled" menu item (see Figure 436), pressing the *Enter* button will change the menu item to "Speaker Is Enabled". This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. When the speaker is disabled, no audible alerts or key click will be generated. The factory default has the speaker enabled.

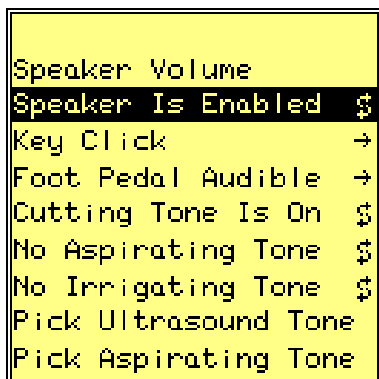


Figure 435

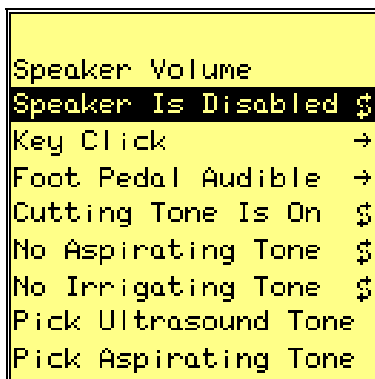


Figure 436

AUDIO SERVICES

KEY CLICK

The key click menu has items used to control key click. With the cursor on the “Key Click” menu item (see Figure 437), pressing the RIGHT ARROW button will display the key click menu help screen (see Figure 438). This help screen indicates that a toggle entry is present in the key click menu list. A menu item that ends with the double arrow character will toggle between two values when the *Enter* button is pressed. Pressing the RIGHT ARROW button will move past the help screen to the key click menu list (see Figure 439). At the top of the display, the text KEY CLICK indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position. To exit the utilities menu, press the *Display* button.

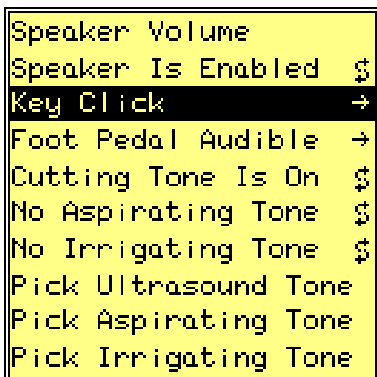


Figure 437

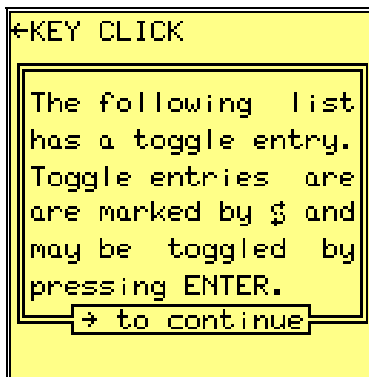


Figure 438

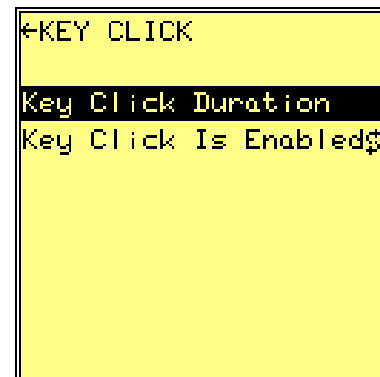


Figure 439

KEY CLICK DURATION

The key click duration command can be used to adjust the key click duration. With the cursor on the “Key Click Duration” menu item (see Figure 439), pressing the RIGHT ARROW will display the key click duration help screen (see Figure 440). Pressing the RIGHT ARROW button again will move past the help screen to the “Key Click Duration” command (see Figure 441). The UP ARROW and DOWN ARROW buttons are used to increase and decrease the key click duration. Pressing the *Enter* button will save the displayed value in the active configuration and exit the key click duration command. Pressing the LEFT ARROW will discard any changes made and restore the key click duration to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the key click duration is 50%.

AUDIO SERVICES

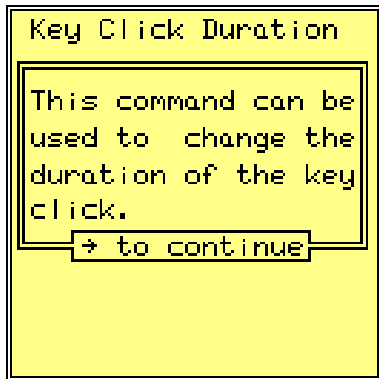


Figure 440

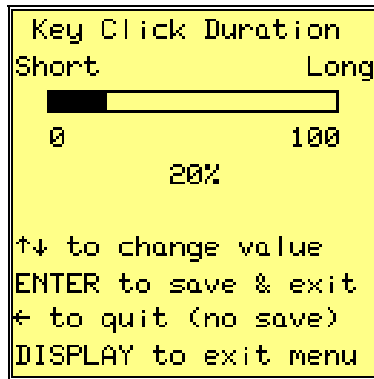


Figure 441

KEY CLICK IS ENABLED/KEY CLICK DISABLED

This menu item can be used to enable or disable key click. With the cursor on the “Key Click Is Enabled” menu item (see Figure 442), pressing the *Enter* button will change the menu item to “Key Click Disabled”. Likewise, with the cursor on the “Key Click Disabled” menu item (see Figure 443), pressing the *Enter* button will change the menu item to “Key Click Is Enabled”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. When key click is enabled, pressing a button will generate audible feedback. If key click is disabled, no audible feed back will be generated. The factory default has key click enabled.

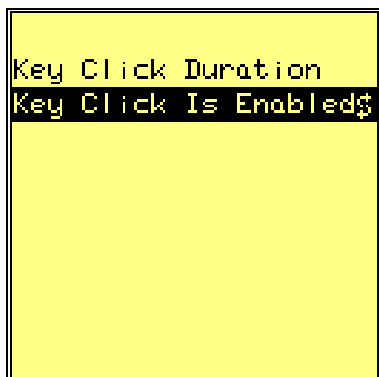


Figure 442

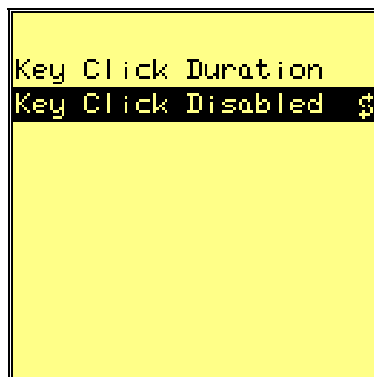


Figure 443

AUDIO SERVICES

FOOT PEDAL AUDIBLE

The foot pedal audible menu has items used to select when the foot pedal audible is played. When the foot pedal audible is enabled, the foot pedal position will generate a variable rate clicking sound. If the foot pedal audible is disabled, no audible feed back will be generated. With the cursor on the “Foot Pedal Audible” menu item (see Figure 444), pressing the RIGHT ARROW button will display the foot pedal audible menu help screen (see Figure 445). This help screen indicates that a toggle entry is present in the foot pedal audible menu list. A menu item that ends with the double arrow character will toggle between two values when the *Enter* button is pressed. Pressing the RIGHT ARROW button will move past the help screen to the foot pedal audible menu list (see Figure 446). At the top of the display, the text FOOT PEDAL AUDIBLE indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position. To exit the utilities menu, press the *Display* button.

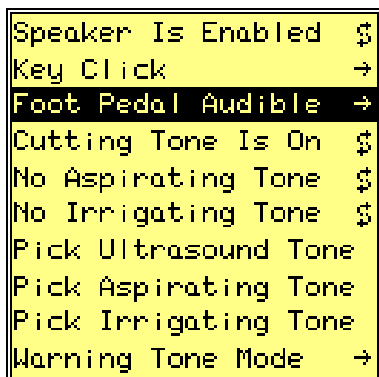


Figure 444

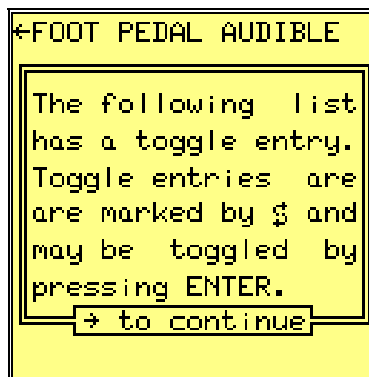


Figure 445

OFF FOR VITRECTOR/ON FOR VITRECTOR

This menu item can be used to enable or disable the foot pedal audible indication generated when the vitrector surgical function is enabled. With the cursor on the “Off For Vitrector” menu item (see Figure 446), pressing the *Enter* button will change the menu item to “On For Vitrector”. Likewise, with the cursor on the “On For Vitrector” menu item (see Figure 447), pressing the *Enter* button will change the menu item to “Off For Vitrector”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. When the foot pedal audible is enabled, the foot pedal position will generate a variable rate clicking sound. If the foot pedal audible is disabled, no audible feed back will be generated. The factory default has the foot pedal audible for the vitrector disabled.

AUDIO SERVICES

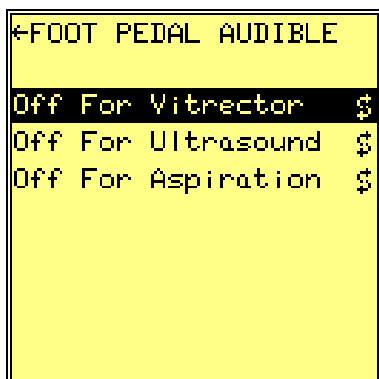


Figure 446

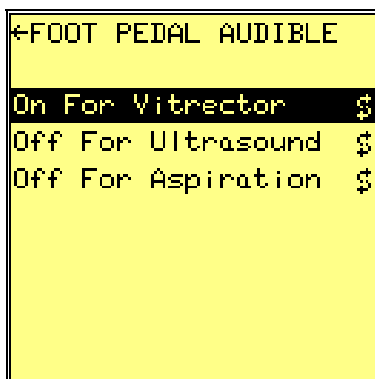


Figure 447

OFF FOR ULTRASOUND/ON FOR ULTRASOUND

This menu item can be used to enable or disable the foot pedal audible indication generated when the ultrasound surgical function is enabled. With the cursor on the “Off For Ultrasound” menu item (see Figure 448), pressing the *Enter* button will change the menu item to “On For Ultrasound”. Likewise, with the cursor on the “On For Ultrasound” menu item (see Figure 449), pressing the *Enter* button will change the menu item to “Off For Ultrasound”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. When the foot pedal audible is enabled, the foot pedal position will generate a variable rate clicking sound. If the foot pedal audible is disabled, no audible feed back will be generated. The factory default has the foot pedal audible for the ultrasound disabled.

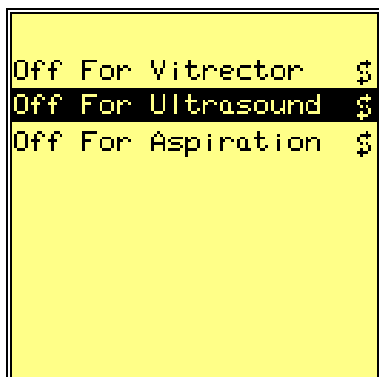


Figure 448

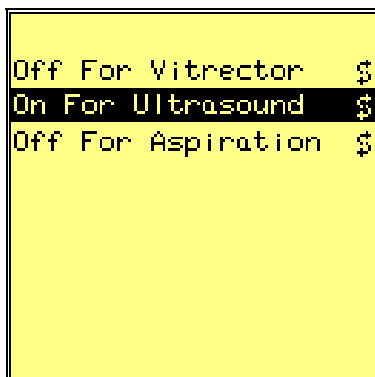


Figure 449

AUDIO SERVICES

OFF FOR ASPIRATION/ON FOR ASPIRATION

This menu item can be used to enable or disable the foot pedal audible indication generated when the vitrector and ultrasound surgical functions are disabled. With the cursor on the “Off For Aspiration” menu item (see Figure 450), pressing the *Enter* button will change the menu item to “On For Aspiration”. Likewise, with the cursor on the “On For Aspiration” menu item (see Figure 451), pressing the *Enter* button will change the menu item to “Off For Aspiration”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. When the foot pedal audible is enabled, the foot pedal position will generate a variable rate clicking sound. If the foot pedal audible is disabled, no audible feed back will be generated. The factory default has the foot pedal audible disabled.

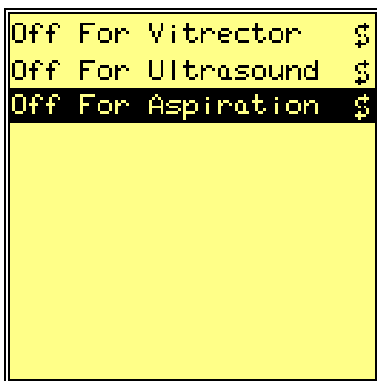


Figure 450

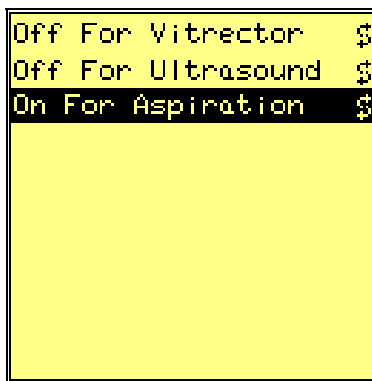


Figure 451

CUTTING TONE IS ON/OFF

This menu item can be used to enable or disable the ultrasound cutting tone. With the cursor on the “Cutting Tone Is On” menu item (see Figure 452), pressing the *Enter* button will change the menu item to “Cutting Tone Is Off”. Likewise, with the cursor on the “Cutting Tone Is Off” menu item (see Figure 453), pressing the *Enter* button will change the menu item to “Cutting Tone Is On”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. When the cutting tone is disabled, no audible indication of energy present on the ultrasound handpiece will be given. The factory default has the cutting tone enabled.

AUDIO SERVICES

Key Click	→
Foot Pedal Audible	→
Cutting Tone Is On	\$
No Aspirating Tone	\$
No Irrigating Tone	\$
Pick Ultrasound Tone	
Pick Aspirating Tone	
Pick Irrigating Tone	
Warning Tone Mode	→
Warning Tone Duration	

Figure 452

Key Click	→
Foot Pedal Audible	→
Cutting Tone Is Off	\$
No Aspirating Tone	\$
No Irrigating Tone	\$
Pick Ultrasound Tone	
Pick Aspirating Tone	
Pick Irrigating Tone	
Warning Tone Mode	→
Warning Tone Duration	

Figure 453

PLAY ASPIRATING TONE/NO ASPIRATING TONE

This menu item can be used to enable or disable the aspirating tone. With the cursor on the “No Aspirating Tone” menu item (see Figure 454), pressing the *Enter* button will change the menu item to “Play Aspirating Tone”. Likewise, with the cursor on the “Play Aspirating Tone” menu item (see Figure 455), pressing the *Enter* button will change the menu item to “No Aspirating Tone”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. When the aspirating tone is disabled, no tone will be played while aspirating. When the aspirating tone is enabled, a tone will play while aspirating in anterior modes. The factory default has the aspirating tone disabled.

Foot Pedal Audible	→
Cutting Tone Is On	\$
No Aspirating Tone	\$
No Irrigating Tone	\$
Pick Ultrasound Tone	
Pick Aspirating Tone	
Pick Irrigating Tone	
Warning Tone Mode	→
Warning Tone Duration	
Error Tone Mode	→

Figure 454

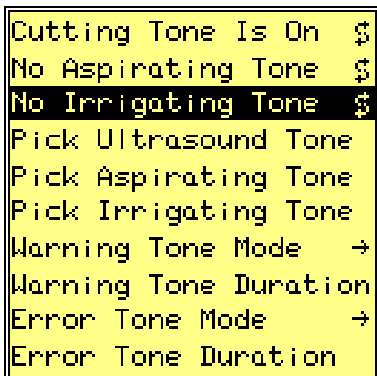
Foot Pedal Audible	→
Cutting Tone Is On	\$
Play Aspirating Tone	\$
No Irrigating Tone	\$
Pick Ultrasound Tone	
Pick Aspirating Tone	
Pick Irrigating Tone	
Warning Tone Mode	→
Warning Tone Duration	
Error Tone Mode	→

Figure 455

AUDIO SERVICES

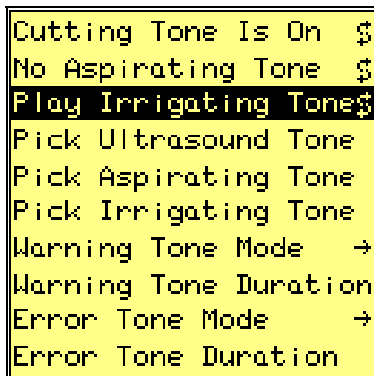
PLAY IRRIGATING TONE/NO IRRIGATING TONE

This menu item can be used to enable or disable the irrigating tone. With the cursor on the “No Irrigating Tone” menu item (see Figure 456), pressing the *Enter* button will change the menu item to “Play Irrigating Tone”. Likewise, with the cursor on the “Play Irrigating Tone” menu item (see Figure 457), pressing the *Enter* button will change the menu item to “No Irrigating Tone”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. When the irrigating tone is disabled, no tone will be played while irrigating. When the irrigating tone is enabled, a tone will play while irrigating in anterior modes. The factory default has the irrigating tone disabled.



```
Cutting Tone Is On $
No Aspirating Tone $
No Irrigating Tone $
Pick Ultrasound Tone
Pick Aspirating Tone
Pick Irrigating Tone
Warning Tone Mode →
Warning Tone Duration
Error Tone Mode →
Error Tone Duration
```

Figure 456



```
Cutting Tone Is On $
No Aspirating Tone $
Play Irrigating Tone$
Pick Ultrasound Tone
Pick Aspirating Tone
Pick Irrigating Tone
Warning Tone Mode →
Warning Tone Duration
Error Tone Mode →
Error Tone Duration
```

Figure 457

PICK ULTRASOUND TONE

The pick ultrasound tone command can be used to select the tone played while energy is delivered to the ultrasound handpiece. One of ten frequencies may be selected. The ultrasound cutting tone may also be disabled by selecting “Cutting Tone Is Off” in the Audio Services menu. With the cursor on the “Pick Ultrasound Tone” menu item (see Figure 458), pressing the RIGHT ARROW will display the pick ultrasound tone help screen (see Figure 459). Pressing the RIGHT ARROW button again will move past the help screen to the “Ultrasound Tone” command (see Figure 460). The currently selected frequency is displayed. Using the UP ARROW and DOWN ARROW buttons, select the desired frequency and press *Enter*. To exit this command press the LEFT ARROW button. To exit the utilities menu, press the *Display* button. The factory default for the ultrasound tone is 275 Hz.

AUDIO SERVICES

```

No Aspirating Tone  $
No Irrigating Tone  $
Pick Ultrasound Tone
Pick Aspirating Tone
Pick Irrigating Tone
Warning Tone Mode   →
Warning Tone Duration
Error Tone Mode      →
Error Tone Duration
Tone Repetition Rate
    
```

Figure 458

```

      Ultrasound Tone

      This command can be
      used to change the
      ultrasound cutting
      tone.

      → to continue
    
```

Figure 459

```

      Ultrasound Tone

      275 Hz

      ↑↓ to change value
      ENTER to save & exit
      ← to quit (no save)
      DISPLAY to exit menu
    
```

Figure 460

PICK ASPIRATING TONE

The pick aspirating tone command can be used to select the tone played while aspirating. One of ten frequencies may be selected. The aspirating tone may also be disabled by selecting “No Aspirating Tone” in the Audio Services menu. With the cursor on the “Pick Aspirating Tone” menu item (see Figure 461), pressing the RIGHT ARROW will display the pick aspirating tone help screen (see Figure 462). Pressing the RIGHT ARROW button again will move past the help screen to the “Aspirating Tone” command (see Figure 463). The currently selected frequency is displayed. Using the UP ARROW and DOWN ARROW buttons, select the desired frequency and press *Enter*. To exit this command press the LEFT ARROW button. To exit the utilities menu, press the *Display* button. The factory default for the aspirating tone is 258 Hz.

```

No Irrigating Tone  $
Pick Ultrasound Tone
Pick Aspirating Tone
Pick Irrigating Tone
Warning Tone Mode   →
Warning Tone Duration
Error Tone Mode      →
Error Tone Duration
Tone Repetition Rate
Load Factory Defaults
    
```

Figure 461

```

      Aspirating Tone

      This command can be
      used to change the
      aspiration active
      tone for anterior
      modes.

      → to continue
    
```

Figure 462

```

      Aspirating Tone

      258 Hz

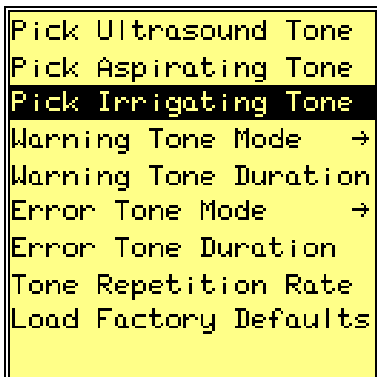
      ↑↓ to change value
      ENTER to save & exit
      ← to quit (no save)
      DISPLAY to exit menu
    
```

Figure 463

AUDIO SERVICES

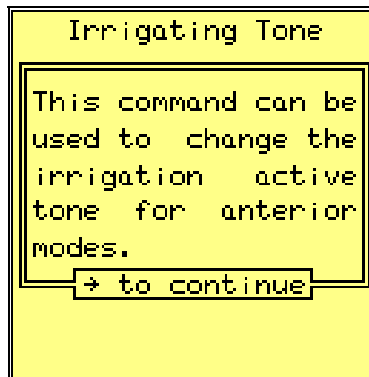
PICK IRRIGATING TONE

The pick irrigating tone command can be used to select the tone played while irrigating. One of ten frequencies may be selected. The irrigating tone may also be disabled by selecting “No Irrigating Tone” in the Audio Services menu. With the cursor on the “Pick Irrigating Tone” menu item (see Figure 464), pressing the RIGHT ARROW will display the pick irrigating tone help screen (see Figure 465). Pressing the RIGHT ARROW button again will move past the help screen to the “Irrigating Tone” command (see Figure 466). The currently selected frequency is displayed. Using the UP ARROW and DOWN ARROW buttons, select the desired frequency and press *Enter*. To exit this command press the LEFT ARROW button. To exit the utilities menu, press the *Display* button. The factory default for the irrigating tone is 242 Hz.



```
Pick Ultrasound Tone
Pick Aspirating Tone
Pick Irrigating Tone
Warning Tone Mode   →
Warning Tone Duration
Error Tone Mode     →
Error Tone Duration
Tone Repetition Rate
Load Factory Defaults
```

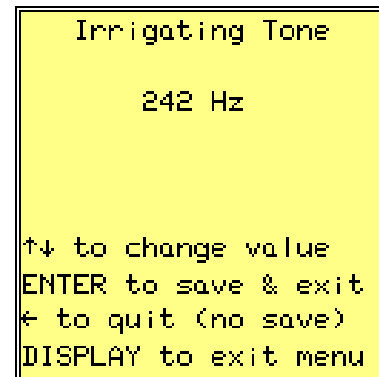
Figure 464



```
Irrigating Tone

This command can be
used to change the
irrigation active
tone for anterior
modes.
→ to continue
```

Figure 465



```
Irrigating Tone

242 Hz

↑↓ to change value
ENTER to save & exit
← to quit (no save)
DISPLAY to exit menu
```

Figure 466

WARNING TONE MODE

The warning tone mode command can be used to select the warning tone mode. Four options are available. When single mode is selected, a single warning tone will sound when a warning condition is detected. In interval mode, when a warning condition is detected, the warning tone will sound at the specified rate. In continuous mode, the warning tone will sound the entire time the warning condition exists. All warning tones may also be disabled. With the cursor on the “Warning Tone Mode” menu item (see Figure 467), pressing the RIGHT ARROW will display the warning tone mode help screen (see Figure 468). This help screen describes how to select an item from a list. Pressing the RIGHT ARROW button again will move past the help screen to the “Warning Tone Mode” list (see Figure 469). The currently selected item is marked with an asterisk. Using the UP ARROW and DOWN ARROW buttons, move the cursor to the desired item and press *Enter*. The asterisk will move the newly selected item. To exit this list press the LEFT ARROW button. To exit the utilities menu, press the *Display* button. The factory default for the warning tone mode is single mode.

AUDIO SERVICES

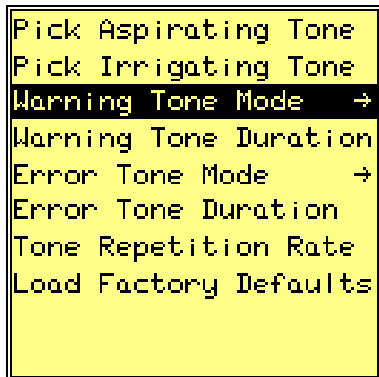


Figure 467

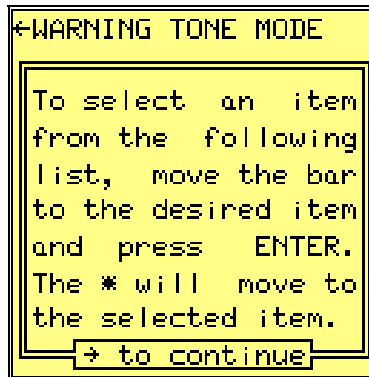


Figure 468

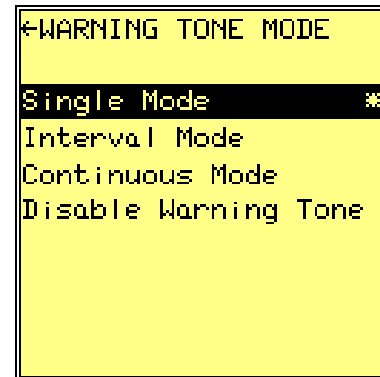


Figure 469

WARNING TONE DURATION

The warning tone duration command can be used to adjust the warning tone duration. With the cursor on the “Warning Tone Duration” menu item (see Figure 470), pressing the RIGHT ARROW will display the warning tone duration help screen (see Figure 471). Pressing the RIGHT ARROW button again will move past the help screen to the “Warning Tone Duration” command (see Figure 472). The UP ARROW and DOWN ARROW buttons are used to increase and decrease the warning tone duration. Pressing the *Enter* button will save the displayed value in the active configuration and exit the warning tone duration command. Pressing the LEFT ARROW will discard any changes made and restore the warning tone duration to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the warning tone duration is 10%.

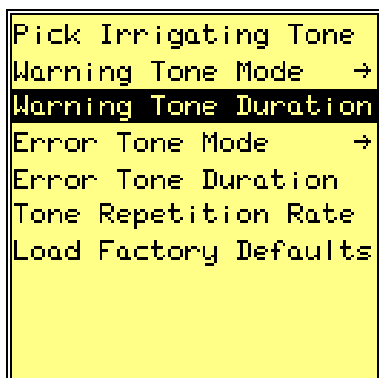


Figure 470

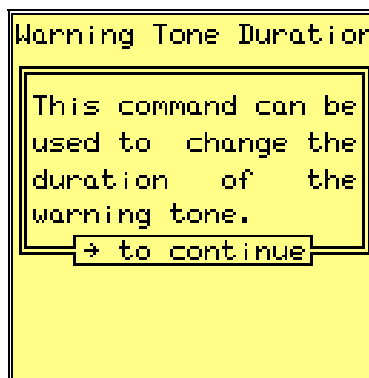


Figure 471

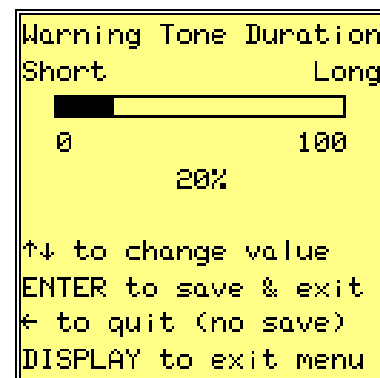


Figure 472

AUDIO SERVICES

ERROR TONE MODE

The error tone mode command can be used to select the error tone mode. Four options are available. When single mode is selected, a single error tone will sound when an error condition is detected. In interval mode, when an error condition is detected, the error tone will sound at the specified rate. In continuous mode, the error tone will sound the entire time the error condition exists. All error tones may also be disabled. With the cursor on the “Error Tone Mode” menu item (see Figure 473), pressing the RIGHT ARROW will display the error tone mode help screen (see Figure 474). This help screen describes how to select an item from a list. Pressing the RIGHT ARROW button again will move past the help screen to the “Error Tone Mode” list (see Figure 475). The currently selected item is marked with an asterisk. Using the UP ARROW and DOWN ARROW buttons, move the cursor to the desired item and press *Enter*. The asterisk will move to the newly selected item. To exit this list press the LEFT ARROW button. To exit the utilities menu, press the *Display* button. The factory default for the error tone mode is single mode.

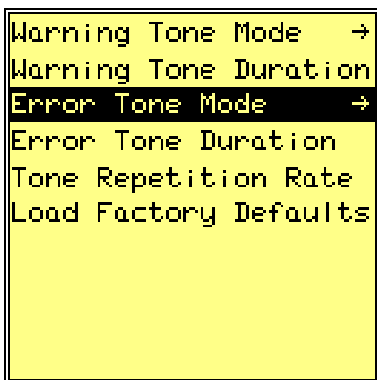


Figure 473

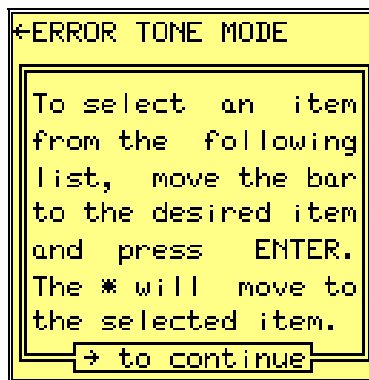


Figure 474

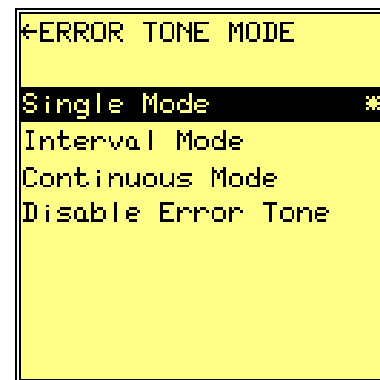
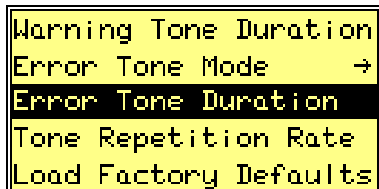


Figure 475

ERROR TONE DURATION

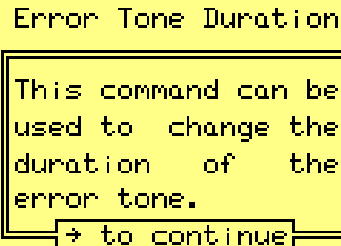
The error tone duration command can be used to adjust the error tone duration. With the cursor on the “Error Tone Duration” menu item (see Figure 476), pressing the RIGHT ARROW will display the error tone duration help screen (see Figure 477). Pressing the RIGHT ARROW button again will move past the help screen to the “Error Tone Duration” command (see Figure 478). The UP ARROW and DOWN ARROW buttons are used to increase and decrease the error tone duration. Pressing the *Enter* button will save the displayed value in the active configuration and exit the error tone duration command. Pressing the LEFT ARROW will discard any changes made and restore the error tone duration to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the error tone duration is 50%.

AUDIO SERVICES



```
Warning Tone Duration
Error Tone Mode      →
Error Tone Duration
Tone Repetition Rate
Load Factory Defaults
```

Figure 476

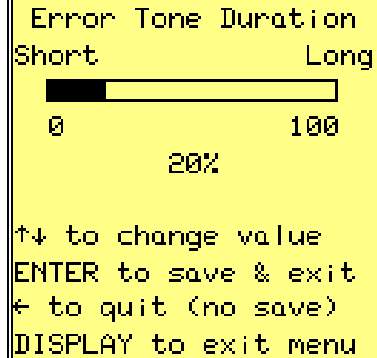


```
Error Tone Duration

This command can be
used to change the
duration of the
error tone.

→ to continue
```

Figure 477



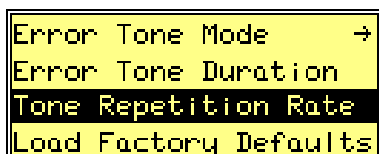
```
Error Tone Duration
Short                      Long
██████████████████████████
0                          100
                        20%

↑↓ to change value
ENTER to save & exit
← to quit (no save)
DISPLAY to exit menu
```

Figure 478

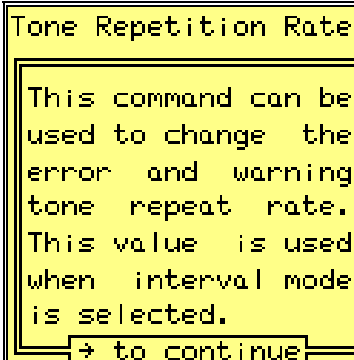
tone repetition rate

The tone repetition rate command can be used to adjust the error/warning tone repetition rate. With the cursor on the “Tone Repetition Rate” menu item (see Figure 479), pressing the RIGHT ARROW will display the tone repetition rate help screen (see Figure 480). Pressing the RIGHT ARROW button again will move past the help screen to the “Tone Repetition Rate” command (see Figure 481). The UP ARROW and DOWN ARROW buttons are used to increase and decrease the tone repetition rate. Pressing the *Enter* button will save the displayed value in the active configuration and exit the tone repetition rate command. Pressing the LEFT ARROW will discard any changes made and restore the tone repetition rate to its previous value. To exit the utilities menu, press the *Display* button. The factory default for the error/warning tone repetition rate is 20%.



```
Error Tone Mode      →
Error Tone Duration
Tone Repetition Rate
Load Factory Defaults
```

Figure 479

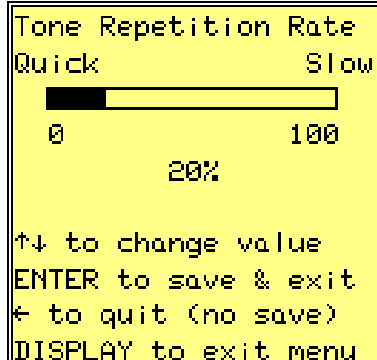


```
Tone Repetition Rate

This command can be
used to change the
error and warning
tone repeat rate.
This value is used
when interval mode
is selected.

→ to continue
```

Figure 480



```
Tone Repetition Rate
Quick                      Slow
██████████████████████████
0                          100
                        20%

↑↓ to change value
ENTER to save & exit
← to quit (no save)
DISPLAY to exit menu
```

Figure 481

AUDIO SERVICES

LOAD FACTORY DEFAULTS

The load factory defaults command will load the factory defaults for all of the parameters adjustable in the audio services menu. With the cursor on the “Load Factory Defaults” menu item (see Figure 482), pressing the RIGHT ARROW will display the load audio defaults help screen (see Figure 483). Pressing the RIGHT ARROW button will move past the help screen to the “Load Audio Defaults” command (see Figure 484). Pressing the LEFT ARROW will terminate the load audio defaults command. Pressing the *Enter* button will load the factory defaults for the audio area. Once the defaults are loaded, the *Enter* button will need to be pressed again. To exit the utilities menu, press the *Display* button.

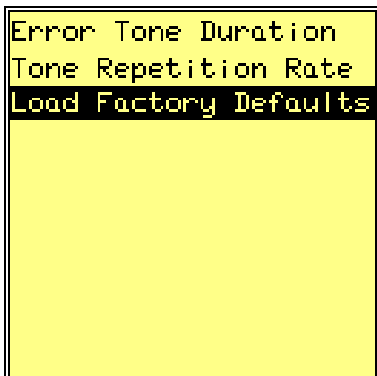


Figure 482

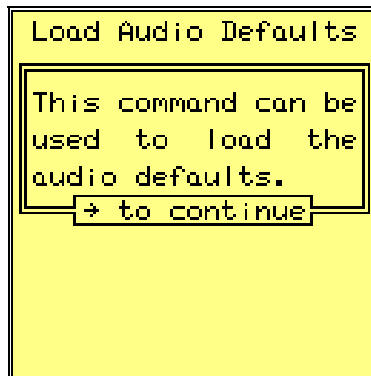


Figure 483

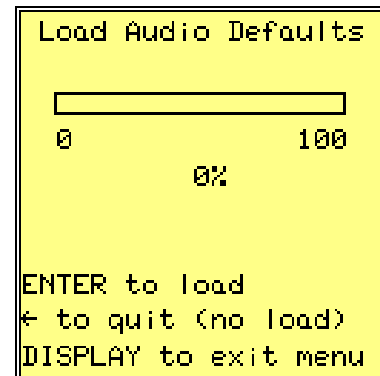


Figure 484

DATE & TIME

DATE & TIME

The date & time menu has items used to control the internal time keeper. With the cursor on the “Date & Time” menu item (see Figure 485), pressing the RIGHT ARROW button will display the date & time menu list (see Figure 486). At the top of the display, the text DATE & TIME indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position.



Figure 485

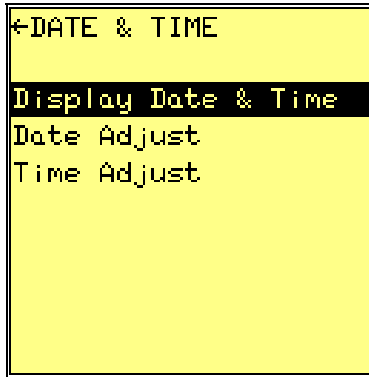


Figure 486

DISPLAY DATE & TIME

The display date & time command will display the current date and time. With the cursor on the “Display Date & Time” menu item (see Figure 486), pressing the RIGHT ARROW will display the display date & time help screen (see Figure 487). Pressing the RIGHT ARROW button again will move past the help screen to the “Display Date & Time” display (see Figure 488). To exit, press the LEFT ARROW button. To exit the utilities menu, press the *Display* button.

DATE & TIME

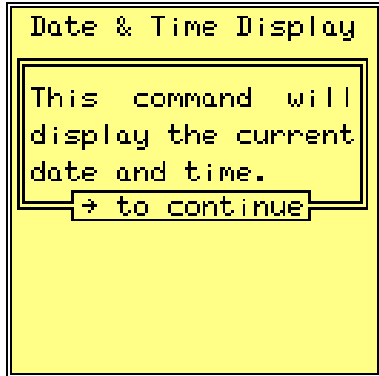


Figure 487

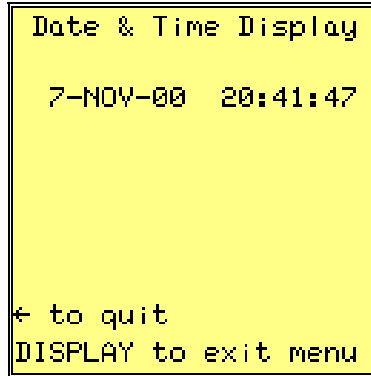


Figure 488

DATE ADJUST

The date adjust command can be used to set the date. With the cursor on the "Date Adjust" menu item (see Figure 489), pressing the RIGHT ARROW will display date adjust help screen (see Figure 490). Pressing the RIGHT ARROW button again will move past the help screen to the "Date Adjust" command (see Figure 491). The date is specified in day-month-year format. The LEFT ARROW and RIGHT ARROW buttons will move the cursor between the day, month and year values. The UP ARROW and DOWN ARROW buttons are used to increase and decrease the value above the cursor. Pressing the *Enter* button will save the date and exit the date adjust command. Pressing the LEFT ARROW, with the cursor under the left most field, will discard any changes made. To exit the utilities menu, press the *Display* button.

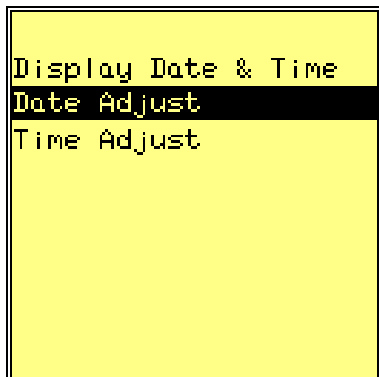


Figure 489

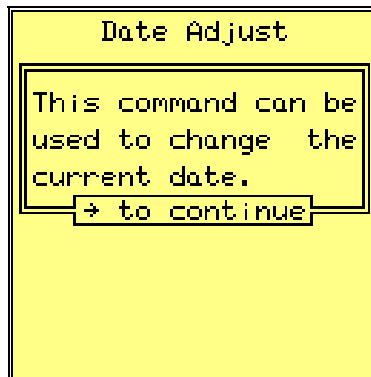


Figure 490

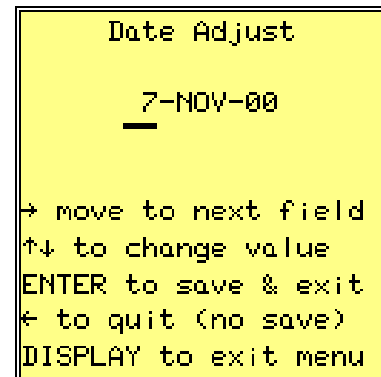


Figure 491

DATE & TIME

TIME ADJUST

The time adjust command can be used to set the time. With the cursor on the "Time Adjust" menu item (see Figure 492), pressing the RIGHT ARROW will display time adjust help screen (see Figure 493). Pressing the RIGHT ARROW button again will move past the help screen to the "Time Adjust" command (see Figure 494). The time is specified in hours; minutes; seconds format. The LEFT ARROW and RIGHT ARROW buttons will move the cursor between the hours, minutes and seconds values. The UP ARROW and DOWN ARROW buttons are used to increase and decrease the value above the cursor. Pressing the *Enter* button will save the time and exit the time adjust command. Pressing the LEFT ARROW, with the cursor under the left most field, will discard any changes made. To exit the utilities menu, press the *Display* button.

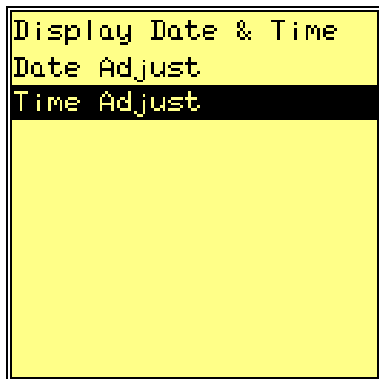


Figure 492

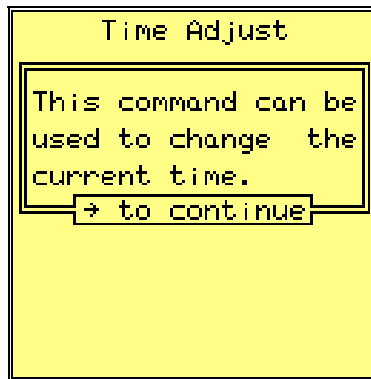


Figure 493

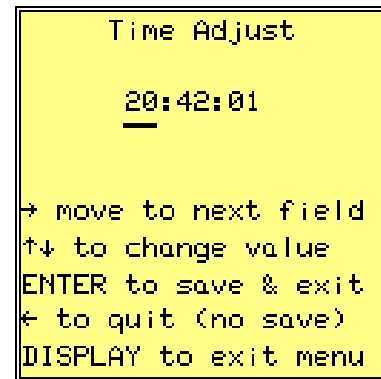


Figure 494

VALUES

VALUES

The values menu has items used to display various internal device states. With the cursor on the “Values” menu item (see Figure 495), pressing the RIGHT ARROW button will display the values menu list (see Figure 496). At the top of the display, the text VALUES indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position.



Figure 495

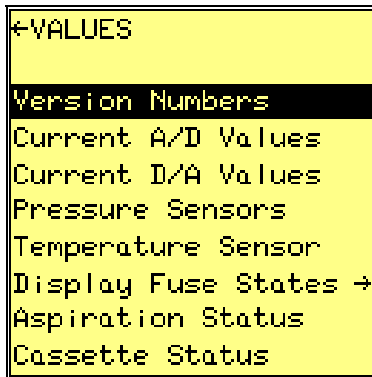


Figure 496

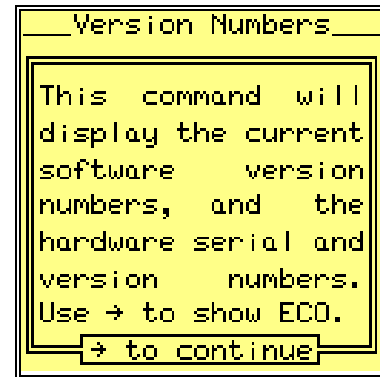


Figure 497

VERSION NUMBERS

The version numbers command will display the hardware and software version numbers, the hardware ECO level and the part numbers and revision letters for the circuit boards. With the cursor on the “Version Numbers” menu item (see Figure 496), pressing the RIGHT ARROW will display the version numbers help screen (see Figure 497). Pressing the RIGHT ARROW button again will move past the help screen to the “Version Numbers” display (see Figure 498). Pressing the RIGHT ARROW button again will display the hardware ECO level (see Figure 499). Pressing the RIGHT ARROW button again will display the part numbers and revision letters (see Figure 500). Each time the right arrow is pressed, the columns following the board descriptions will cycle through the three types of information. To exit, press the LEFT ARROW button. To exit the utilities menu, press the *Display* button.

VALUES

Version Numbers		
	Ver	
VitMan Software	18	
Boot Code	18	
	Ver	S/N
CPU Board	4	00025
Analog	5	00025
Ultrasound	1	00025

Figure 498

Version Numbers		
	Ver	
VitMan Software	18	
Boot Code	18	
	ECO	S/N
CPU Board	1	00025
Analog	18	00025
Ultrasound	0	00025

Figure 499

Version Numbers		
	Ver	
VitMan Software	18	
Boot Code	18	
	PartNo	Rev
CPU Board	1000434	C
Analog	1000435	D
Ultrasound	1000746	A

Figure 500

CURRENT A/D VALUES

The current A/D values command will display the current A/D values. With the cursor on the “Current A/D Values” menu item (see Figure 501), pressing the RIGHT ARROW will display the A/D values help screen (see Figure 502). Pressing the RIGHT ARROW button again will move past the help screen to the “A/D Values” display (see Figure 503). To exit, press the LEFT ARROW button. To exit the utilities menu, press the *Display* button.

Version Numbers
Current A/D Values
Current I/A Values
Pressure Sensors
Temperature Sensor
Display Fuse States →
Aspiration Status
Cassette Status
Ultrasound Status

Figure 501

A/D Values
This command will display the current A/D readings.
→ to continue

Figure 502

A/D Values			
Air	25	Eye	25
50cc	125	500cc	702
Pedal	55%	Drive	2558
BulbA	04D2	BulbB	AF0F
Power	2A61	Vcc	484
Pump	4F42		
Settings			
Asp	250	Air	25
Vit	600	Ult	50

Figure 503

VALUES

CURRENT D/A VALUES

The current D/A values command will display the current D/A values. With the cursor on the “Current D/A Values” menu item (see Figure 504), pressing the RIGHT ARROW will display the D/A values help screen (see Figure 505). Pressing the RIGHT ARROW button again will move past the help screen to the “D/A Values” display (see Figure 506). To exit, press the LEFT ARROW button. To exit the utilities menu, press the *Display* button.

Version Numbers
Current A/D Values
Current D/A Values
Pressure Sensors
Temperature Sensor
Display Fuse States →
Aspiration Status
Cassette Status
Ultrasound Status
Air Exchange Status

Figure 504

D/A Values
This command will display the current D/A settings.
→ to continue

Figure 505

D/A Values			
Air	5913	Asp	3DBC
Thres	1892	Level	0800
Power	B450	Freq	921E
Back	EC00	Cont	80A8
LEDs	9680	Illum	D780
Audio	5240	Off	17A0
Settings			
Asp	250	Air	25
Pedal	55%	Ult	50

Figure 506

PRESSURE SENSORS

The pressure sensors command will display the current pressure sensor values. With the cursor on the “Pressure Sensors” menu item (see Figure 507), pressing the RIGHT ARROW will display the pressure sensors help screen (see Figure 508). Pressing the RIGHT ARROW button again will move past the help screen to the “Pressure Sensors” display (see Figure 509). This will display the average value returned from the sensor (Avg), the current value (Now) and the atmospheric default (Atmos). Pressing the RIGHT ARROW button again will move to the alternate display (see Figure 510). This will display the maximum value returned from the sensors (Max), the minimum value (Min) and the difference (Span). Each time the right arrow is pressed, the display will toggle between the Avg/Now/Atmos and the Max/Min/Span displays. The DOWN ARROW will reset the maximum and minimum values, and set the span to zero. To exit, press the LEFT ARROW button. To exit the utilities menu, press the *Display* button.

VALUES

```

Current A/D Values
Current D/A Values
Pressure Sensors
Temperature Sensor
Display Fuse States →
Aspiration Status
Cassette Status
Ultrasound Status
Air Exchange Status
Vitrector Status
  
```

Figure 507

```

__Pressure Sensors__
This command will
display the current
pressure sensor
values. Use → to
show limits. Use ↓
to reset limits.
→ to continue
  
```

Figure 508

```

__Pressure Sensors__
      Avg  Now  Atmos
50cc  2DD2  2DC0  09F9
500cc  C014  C040  09FF
Eye    3BF2  3CA0  1A23
Air    3C90  3D30  1A56
Drive  8E6A  8E20  3FB7
      Settings
Asp    250  Air    25
Vit    600  Pedal  55%
  
```

Figure 509

```

__Pressure Sensors__
      Max  Min  Span
50cc  2E00  2D90  0070
500cc  BFC0  BFB0  0010
Eye    3C30  3BF0  0040
Air    3C60  3C00  0060
Drive  8EB0  8DF0  00C0
      Settings
Asp    250  Air    25
Vit    600  Pedal  55%
  
```

Figure 510

TEMPERATURE SENSOR

The temperature sensor command will display the current temperature sensor values. With the cursor on the “Temperature Sensor” menu item (see Figure 511), pressing the RIGHT ARROW will display the pressure sensors help screen (see Figure 512). Pressing the RIGHT ARROW button again will move past the help screen to the “Temperature Sensor” display (see Figure 513). To exit, press the LEFT ARROW button. To exit the utilities menu, press the *Display* button.

VALUES

```

Current I/A Values
Pressure Sensors
Temperature Sensor
Display Fuse States →
Aspiration Status
Cassette Status
Ultrasound Status
Air Exchange Status
Vitrector Status
Pulse Width Status
  
```

Figure 511

```

_Temperature Sensor_

This command will
display the current
temperature sensor
values.

→ to continue
  
```

Figure 512

```

_Temperature Sensor_

°C  °F
Current:  +33 +91
Low Limit: +10 +50
High Limit: +50 +122
Maximum:  +39 +102
Minimum:  +21 +69
  
```

Figure 513

DISPLAY FUSE STATES

The display fuse states menu has items used to display the analog and CPU board fuses. With the cursor on the “Display Fuse States” menu item (see Figure 514), pressing the RIGHT ARROW button will display the display fuse states menu list (see Figure 515). At the top of the display, the text DISPLAY FUSE STATES indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position. To exit the utilities menu, press the *Display* button.

```

Pressure Sensors
Temperature Sensor
Display Fuse States →
Aspiration Status
Cassette Status
Ultrasound Status
Air Exchange Status
Vitrector Status
Pulse Width Status
Disk Status - Write
  
```

Figure 514

```

←DISPLAY FUSE STATES

CPU Board Fuses
Analog Supply Fuses
Analog Device Fuses
  
```

Figure 515

VALUES

CPU BOARD FUSES

The CPU board fuses command will display the fuse states of the CPU board. With the cursor on the “CPU Board Fuses” menu item (see Figure 515), pressing the RIGHT ARROW will display the CPU board fuses help screen (see Figure 516). Pressing the RIGHT ARROW button again will move past the help screen to the “CPU Board Fuses” display (see Figure 517). To exit, press the LEFT ARROW button. To exit the utilities menu, press the *Display* button.

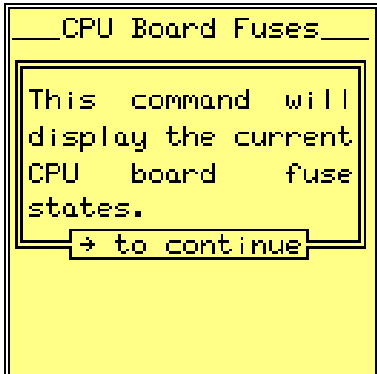


Figure 516

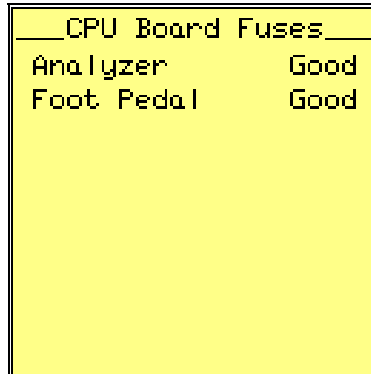


Figure 517

ANALOG SUPPLY FUSES

The analog supply fuses command will display the supply fuse states of the analog board. With the cursor on the “Analog Supply Fuses” menu item (see Figure 518), pressing the RIGHT ARROW will display the analog supply fuses help screen (see Figure 519). Pressing the RIGHT ARROW button again will move past the help screen to the “Analog Supply Fuses” display (see Figure 520). To exit, press the LEFT ARROW button. To exit the utilities menu, press the *Display* button.

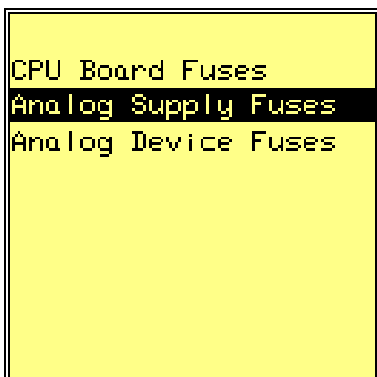


Figure 518

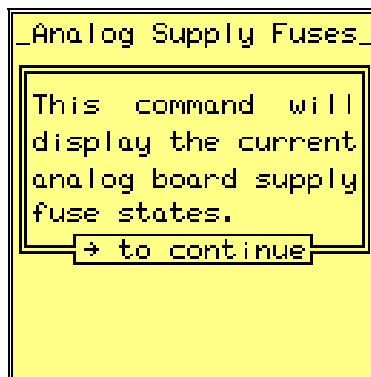


Figure 519

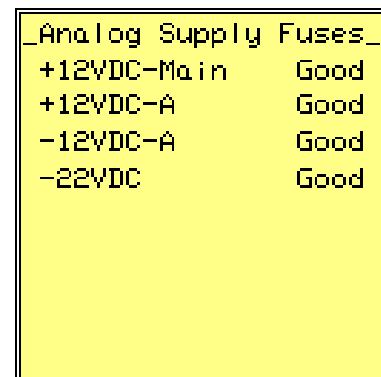


Figure 520

ANALOG DEVICE FUSES

The analog device fuses command will display the device fuse states of the analog board. With the cursor on the “Analog Device Fuses” menu item (see Figure 521), pressing the RIGHT ARROW will display the analog device fuses help screen (see Figure 522). Pressing the RIGHT ARROW button again will move past the help screen to the “Analog Device Fuses” display (see Figure 523). To exit, press the LEFT ARROW button. To exit the utilities menu, press the *Display* button.

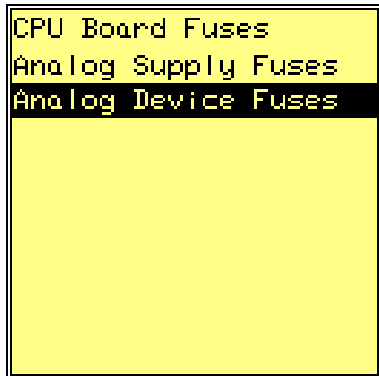


Figure 521

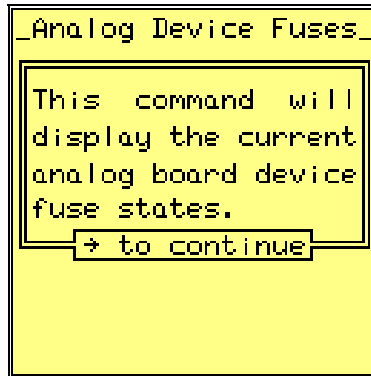
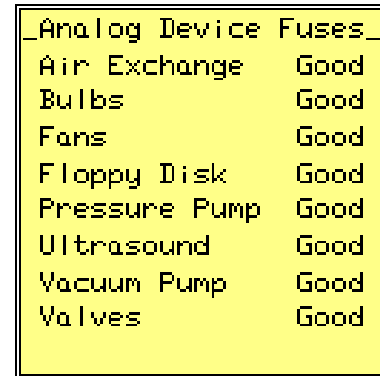


Figure 522



Analog Device Fuses	
Air Exchange	Good
Bulbs	Good
Fans	Good
Floppy Disk	Good
Pressure Pump	Good
Ultrasound	Good
Vacuum Pump	Good
Valves	Good

Figure 523

ASPIRATION STATUS

The aspiration status command will display the aspiration status. With the cursor on the “Aspiration Status” menu item (see Figure 524), pressing the RIGHT ARROW will display the aspiration status help screen (see Figure 525). Pressing the RIGHT ARROW button again will move past the help screen to the “Aspiration Status” display (see Figure 526). To exit, press the LEFT ARROW button. To exit the utilities menu, press the *Display* button.

VALUES

```

Temperature Sensor
Display Fuse States →
Aspiration Status
Cassette Status
Ultrasound Status
Air Exchange Status
Vitrector Status
Pulse Width Status
Disk Status - Write
  
```

Figure 524

```

__Aspiration Status__

This command will
display the current
aspiration status.
→ to continue
  
```

Figure 525

```

__Aspiration Status__
50cc 125 500cc 702
Set 250 Flags 2501
Pedal 55% Flag2 0841
Pump on Valve open
Open 2694 Hours 72
__D/A Values__
Mult 3299 Off 1340
Thres 183F LoVac 1380
MaxVac 702 Calib 1340
  
```

Figure 526

CASSETTE STATUS

The cassette status command will display information relevant to the aspiration cassette. With the cursor on the “Cassette Status” menu item (see Figure 527), pressing the RIGHT ARROW will display the cassette status help screen (see Figure 528). Pressing the RIGHT ARROW button again will move past the help screen to the “Cassette Status” display (see Figure 529). To exit, press the LEFT ARROW button. To exit the utilities menu, press the *Display* button.

```

Display Fuse States →
Aspiration Status
Cassette Status
Ultrasound Status
Air Exchange Status
Vitrector Status
Pulse Width Status
Disk Status - Write
  
```

Figure 527

```

__Cassette Status__

This command will
display the current
aspiration cassette
values.
→ to continue
  
```

Figure 528

```

__Cassette Status__
Cassette is present
Vacuum pump enabled
Level .....!!!! 6
50cc level ..
Cassette valve ok
__Relevant Values__
Set 250 Pedal 55%
50cc 125 500cc 702
Vacum 3DCE Illum D780
  
```

Figure 529

VALUES

ULTRASOUND STATUS

The ultrasound status command will display information relevant to the ultrasound. With the cursor on the "Ultrasound Status" menu item (see Figure 530), pressing the RIGHT ARROW will display the ultrasound status help screen (see Figure 531). Pressing the RIGHT ARROW button again will move past the help screen to the normal "Ultrasound Status" display (see Figure 532). Pressing the RIGHT ARROW button again will move to the alternate display (see Figure 533). The alternate display will show the ultrasound usage time, the number of tuning requests, the number of tuning problems and the number of tuning aborts. Each time the right arrow is pressed, the display will toggle between the normal and alternate displays. To exit, press the LEFT ARROW button. To exit the utilities menu, press the *Display* button.

```
Aspiration Status
Cassette Status
Ultrasound Status
Air Exchange Status
Vitrector Status
Pulse Width Status
Disk Status - Write
```

Figure 530

```
__Ultrasound Status__
This command will
display the current
ultrasound values.
Use → to display
usage statistics.
→ to continue
```

Figure 531

```
__Ultrasound Status__
Handpiece is present
Handpiece is tuned
__Tuning Values__
Freq 8F14 PwRtn 5410
LoLim 0000 HiLim FFFF
__Relevant Values__
Set 50 Pulse
Pedal 55% PwRtn 2938
Freq 91FE Power B450
```

Figure 532

```
__Ultrasound Status__
Handpiece is present
Usage time 2 hours
__Tuning Values__
Tuning requests 35
Fail 0 Abort 4
__Relevant Values__
Set 50 Pulse
Pedal 55% PwRtn 28DE
Freq 9375 Power B450
```

Figure 533

VALUES

AIR EXCHANGE STATUS

The air exchange status command will display the air exchange status. With the cursor on the "Air Exchange Status" menu item (see Figure 534), pressing the RIGHT ARROW will display the air exchange status help screen (see Figure 535). Pressing the RIGHT ARROW button again will move past the help screen to the "Air Exchange Status" display (see Figure 536). To exit, press the LEFT ARROW button. To exit the utilities menu, press the *Display* button.

```
Cassette Status
Ultrasound Status
Air Exchange Status
Vitrector Status
Pulse Width Status
Disk Status - Write
```

Figure 534

```
_Air Exchange Status_

This command will
display the current
air exchange pump
status.

→ to continue
```

Figure 535

```
_Air Exchange Status_
Air      25 Eye      25
Set      25 Flags 0019
Pump     on Valve open
Open     2474 Hours  25
Control Loop
Aim      25 Flags 0017
D/A      52F8 A/D     5763
Table 5E30 Limit C7D8
Delta F4C8
```

Figure 536

VITRECTOR STATUS

The vitrector status command will display the vitrector status. With the cursor on the "Vitrector Status" menu item (see Figure 537), pressing the RIGHT ARROW will display the vitrector status help screen (see Figure 538). Pressing the RIGHT ARROW button again will move past the help screen to the "Vitrector Status" display (see Figure 539). To exit, press the LEFT ARROW button. To exit the utilities menu, press the *Display* button.

```
Ultrasound Status
Air Exchange Status
Vitrector Status
Pulse Width Status
Disk Status - Write
```

Figure 537

```
_Vitrector Status_

This command will
display the current
vitrector status.

→ to continue
```

Figure 538

```
_Vitrector Status_
Rate     600 Flags 0049
Set      600 MinRt  400
Pedal    0% Signal  5
Open107251 Valve shut
Drive 2235 Hours   47
Aspiration Status
50cc     1 500cc  630
Set      500 Valve shut
Flags 2121 Flag2 0801
```

Figure 539

VALUES

PULSE WIDTH STATUS

The pulse width status command will display the cut rate/pulse width value pairs for the active pulse width table. The current maximum cut rate allowed, the pulse width modifier, the current cut rate and the current output pulse width are also displayed. The active pulse width table is used to specify the pulse width for the pressure pulse generated on the vitrector output port. Up to eight cut rate/pulse width pairs may be used to modify the vitrector output pulse width. If the current cut rate is below the lowest cut rate specified, the pulse width of the vitrector output pulse will be specified by the pulse width paired with the lowest cut rate specified. If the current cut rate is above the highest cut rate specified, the pulse width of the vitrector output pulse will be specified by the pulse width paired with the highest cut rate specified. If the current cut rate falls on a cut rate found in the table, the pulse width of the vitrector output pulse will be specified by the pulse width paired with the cut rate. If the current cut rate falls between two cut rates specified, the pulse of the vitrector output pulse will vary linearly between the two pulse widths. Note that the order of the cut rate/pulse width pairs in the table will have no effect on the pulse width generated. The Max Rate value specifies the maximum cut rate selectable for the vitrector surgical function. The Modifier value is used to fine tune vitrector performance and is always added to the specified pulse width values. The current cut rate and pulse width are also displayed. With the cursor on the "Pulse Width Status" menu item (see Figure 540), pressing the RIGHT ARROW will display the pulse width status help screen (see Figure 541). Pressing the RIGHT ARROW button again will move past the help screen to the "Pulse Width Status" display (see Figure 542). Initially the first four cut rate/pulse width pairs are displayed. To display the next four, press the RIGHT ARROW button (see Figure 543). To exit, press the LEFT ARROW button. To exit the utilities menu, press the *Display* button.

```
Air Exchange Status
Vitrector Status
Pulse Width Status
Disk Status - Write
```

Figure 540

```
_Pulse Width Status_
This command can be
used to display the
vitrector cutting
parameters.
→ to continue
```

Figure 541

```
_Pulse Width Status_
1. 200 CPM 70.0 mS
2. 350 CPM 60.0 mS
3. 650 CPM 34.0 mS
4. 900 CPM 21.8 mS
Max Rate 2000 CPM
Modifier 0.00 mSec
Current
Cut Rate 600 CPM
Width 38.50 mSec
```

Figure 542

VALUES

Pulse Width Status		
5.	1100 CPM	17.0 mS
6.	1300 CPM	13.5 mS
7.	1500 CPM	12.0 mS
8.	2000 CPM	10.0 mS
Max Rate		2000 CPM
Modifier		0.00 mSec
Current		
Cut Rate		600 CPM
Width		38.50 mSec

Figure 543

DISK STATUS - WRITE

The disk status - write command will display the disk drive status for writes. With the cursor on the "Disk Status - Write" menu item (see Figure 544), pressing the RIGHT ARROW will display the disk status - write help screen (see Figure 545). Pressing the RIGHT ARROW button again will move past the help screen to the "Disk Status - Write" display (see Figure 546). To exit, press the LEFT ARROW button. To exit the utilities menu, press the *Display* button.

Vitrector Status
Pulse Width Status
Disk Status - Write

Figure 544

Disk Status - Write
This command will display the current disk drive values.
→ to continue

Figure 545

Disk Status - Write		
Drive	1	StatReg0 05
Sector	2	StatReg1 00
Track	0	StatReg2 00
Head	1	StatReg3 39

Figure 546

SERVICE MENU

SERVICE MENU

The service menu has items used to service the device. With the cursor on the “Service Menu” menu item (see Figure 547), pressing the RIGHT ARROW button will display the service menu help screen (see Figure 548). Pressing the RIGHT ARROW button again will move past the help screen to the service menu list (see Figure 549). At the top of the display, the text SERVICE MENU indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position.

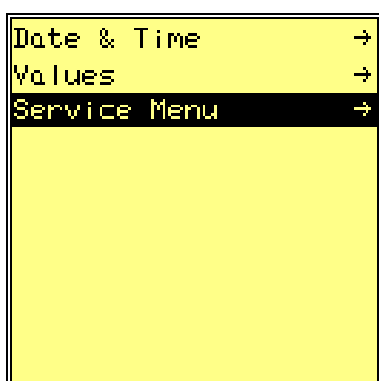


Figure 547

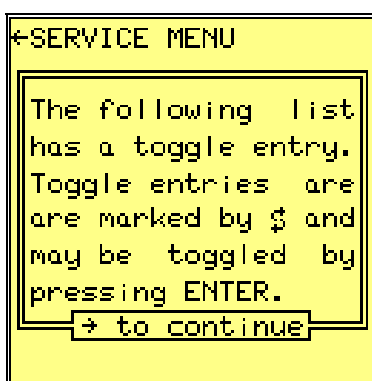


Figure 548

ENABLE THE VITMAN/DISABLE THE VITMAN

This menu item can be used to enable and disable the operation of the device. While disabled the vacuum and pressure pumps will be shut off and no error or warning messages will be generated. In addition, the surgical function LEDs for all enabled surgical functions will be illuminated green. With the cursor on the “Enable the VitMan” menu item (see Figure 549), pressing the *Enter* button will change the menu item to “Disable the VitMan”. Likewise, with the cursor on the “Disable the VitMan” menu item (see Figure 550), pressing the *Enter* button will change the menu item to “Enable the VitMan”. This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. When the pumps are off, only the Air Exchange and Illumination surgical functions will work. This command should only be used while servicing the device.

SERVICE MENU

```

←SERVICE MENU
Enable the VitMan $
Reset the VitMan
Disable Keyboard
Service Illumination→
Service Pneumatics →
Calibration Routines→
Adjust Custom Style →
Read Analog Board
  
```

Figure 549

```

←SERVICE MENU
Disable the VitMan $
Reset the VitMan
Disable Keyboard
Service Illumination→
Service Pneumatics →
Calibration Routines→
Adjust Custom Style →
Read Analog Board
  
```

Figure 550

```

Enable the VitMan $
Reset the VitMan
Disable Keyboard
Service Illumination→
Service Pneumatics →
Calibration Routines→
Adjust Custom Style →
Read Analog Board
Read Ultrasound Board
  
```

Figure 551

RESET THE VITMAN

The reset the VitMan command can be used to reset the VitMan. With the cursor on the “Reset the VitMan” menu item (see Figure 551), pressing the RIGHT ARROW will display the reset the VitMan help screen (see Figure 552). Pressing the RIGHT ARROW button again will move past the help screen to the “Reset the VitMan” command (see Figure 554). Pressing the *Enter* button reset the VitMan. Pressing the LEFT ARROW will exit the reset command. To exit the utilities menu, press the *Display* button. If the reset the VitMan command is selected while any surgical functions are active, a warning screen will appear (see Figure 553) and a warning tone will sound.

```

Reset the VitMan

This command can be
used to reset the
VitMan.
→ to continue
  
```

Figure 552

```

Reset the VitMan

* Caution *
Resetting will have
an immediate effect
on currently active
surgical functions.
→ to continue
  
```

Figure 553

```

Reset the VitMan

Press ENTER to reset

ENTER to reset
← to quit (no reset)
DISPLAY to exit menu
  
```

Figure 554

SERVICE MENU

DISABLE KEYBOARD

The disable keyboard command will disable the keyboard. With the cursor on the “Disable Keyboard” menu item (see Figure 555), pressing the RIGHT ARROW button will display the disable keyboard help screen (see Figure 556). Pressing the RIGHT ARROW button again will disable the keyboard (see Figure 557). Once disabled, the keyboard can only be enabled by pressing down on the foot pedal or powering down the VitMan.

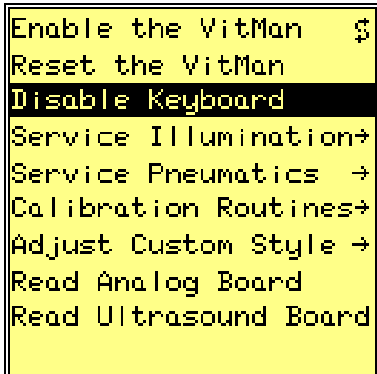


Figure 555

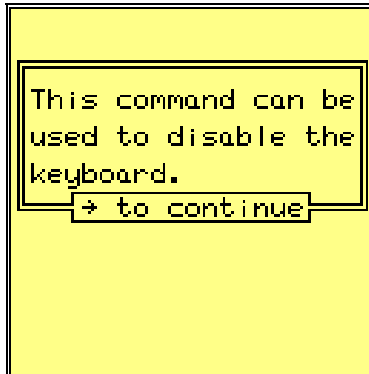


Figure 556

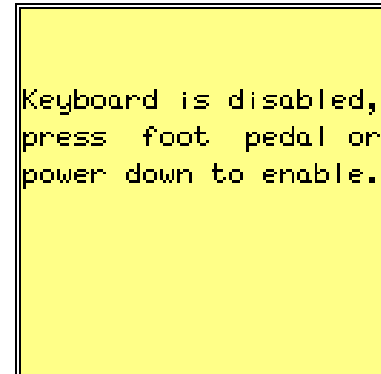


Figure 557

SERVICE ILLUMINATION

The service illumination menu has items used to service the illumination surgical function. With the cursor on the “Service Illumination” menu item (see Figure 558), pressing the RIGHT ARROW button will display service illumination help screen (see Figure 559). Pressing the RIGHT ARROW button again will move past the help screen to the service illumination menu list (see Figure 560). At the top of the display, the text SERVICE ILLUMINATION indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position.

SERVICE MENU

```
Reset the VitMan
Disable Keyboard
Service Illumination→
Service Pneumatics →
Calibration Routines→
Adjust Custom Style →
Read Analog Board
Read Ultrasound Board
```

Figure 558

```
*SERVICE ILLUMINATION

The following list
has a toggle entry.
Toggle entries are
are marked by $ and
may be toggled by
pressing ENTER.
→ to continue
```

Figure 559

```
*SERVICE ILLUMINATION

Display Bulb Info
Clear Bulb Hours →
Plot Bulb "A" Log
Plot Bulb "B" Log
Move To Bulb "B" $
Adjust Bulb Warm Time
```

Figure 560

DISPLAY BULB INFO

The display bulb info command will display illumination bulb information. With the cursor on the "Display Bulb Info" menu item (see Figure 560), pressing the RIGHT ARROW will display the bulb information help screen (see Figure 561). Pressing the RIGHT ARROW button again will move past the help screen to the "Bulb Information" display (see Figure 562). The bulb information display will display the bulb state (present/MISSING/on/warming), the number of hours on the bulb and the date of replacement, for both bulbs. Pressing the RIGHT ARROW button again will move to the alternate "Bulb Information" display (see Figure 563). Each time the right arrow is pressed, the Replaced field will toggle between the date of replacement and the time of replacement. If the bulb is missing, the hours displayed are those accumulated subsequent to burning out. If a bulb burns out while illuminated, the next time a good bulb is detected the hours are cleared and the date is changed. If a bulb is changed before burning out, the "Service Menu:Service Illumination:Clear Bulb Hours" menu should be used to clear the bulb hours and change the date. To exit, press the LEFT ARROW button. To exit the utilities menu, press the *Display* button.

```
__Bulb Information__

This command can be
used to display the
current bulb infor-
mation. Use → to
display the time of
bulb replacement.
→ to continue
```

Figure 561

```
__Bulb Information__

Bulb "A" is present
Hours: 0.000
Replaced: 7-NOV-00

Bulb "B" is present
Hours: 0.000
Replaced: 7-NOV-00
```

Figure 562

```
__Bulb Information__

Bulb "A" is present
Hours: 0.000
Replaced: 20:52:49

Bulb "B" is present
Hours: 0.000
Replaced: 20:52:49
```

Figure 563

SERVICE MENU

CLEAR BULB HOURS

The clear bulb hours menu has items used to clear the illumination bulb hours. With the cursor on the "Clear Bulb Hours" menu item (see Figure 564), pressing the RIGHT ARROW button will display the clear bulb hours menu list (see Figure 565). At the top of the display, the text CLEAR BULB HOURS indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position.

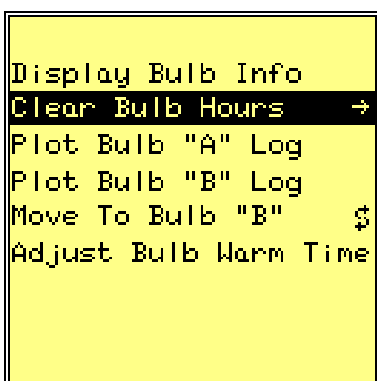


Figure 564

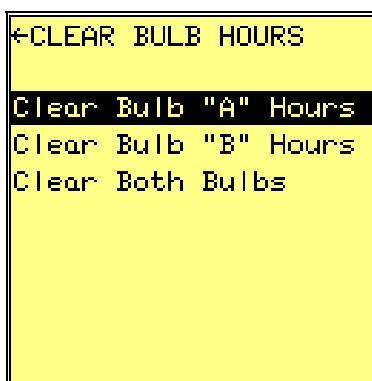


Figure 565

CLEAR BULB "A" HOURS

The clear bulb "A" hours command can be used to clear the bulb "A" hours value. With the cursor on the "Clear Bulb "A" Hours" menu item (see Figure 565), pressing the RIGHT ARROW will display the clear bulb "A" hours help screen (see Figure 566). Pressing the RIGHT ARROW button again will move past the help screen to the "Clear Bulb "A" Hours" command (see Figure 567). Pressing the *Enter* button will clear the bulb "A" hours value and set the replacement date to today's date, then exit the clear bulb "A" hours command. Pressing the LEFT ARROW will exit the clear bulb "A" hours command without clearing the bulb "A" hours value. To exit the utilities menu, press the *Display* button.

SERVICE MENU

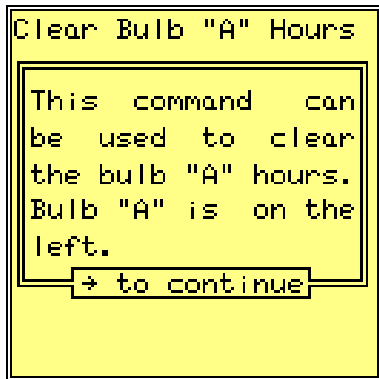


Figure 566

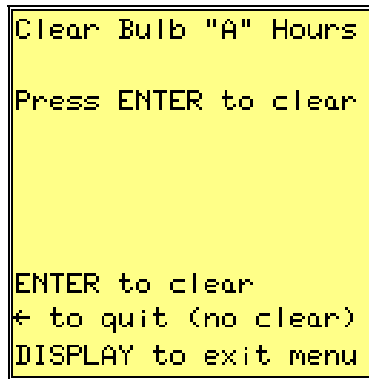


Figure 567

CLEAR BULB "B" HOURS

The clear bulb "B" hours command can be used to clear the bulb "B" hours value. With the cursor on the "Clear Bulb "B" Hours" menu item (see Figure 568), pressing the RIGHT ARROW will display the clear bulb "B" hours help screen (see Figure 569). Pressing the RIGHT ARROW button again will move past the help screen to the "Clear Bulb "B" Hours" command (see Figure 570). Pressing the *Enter* button will clear the bulb "B" hours value and set the replacement date to today's date, then exit the clear bulb "B" hours command. Pressing the LEFT ARROW will exit the clear bulb "B" hours command without clearing the bulb "B" hours value. To exit the utilities menu, press the *Display* button.

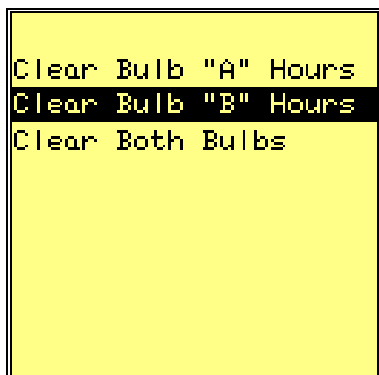


Figure 568

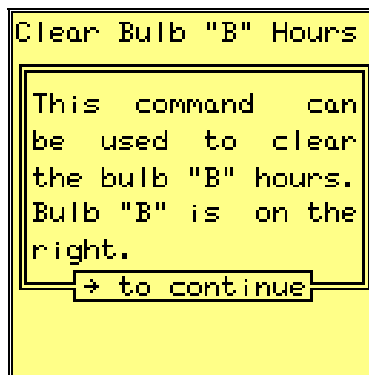


Figure 569

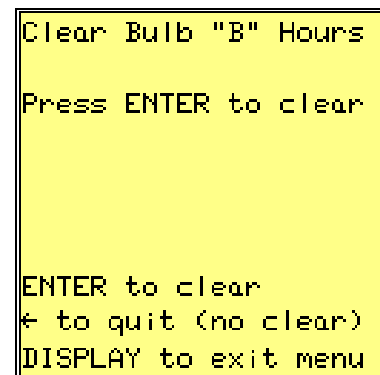


Figure 570

SERVICE MENU

CLEAR BOTH BULBS

The clear both bulbs command can be used to clear the bulb "A" and bulb "B" hours values. With the cursor on the "Clear Both Bulbs" menu item (see Figure 571), pressing the RIGHT ARROW will display the clear both bulbs help screen (see Figure 572). Pressing the RIGHT ARROW button again will move past the help screen to the "Clear Both Bulbs" command (see Figure 573). Pressing the *Enter* button will clear the bulb "A" and bulb "B" hours and set their replacement dates to today's date, then exit the clear both bulbs command. Pressing the LEFT ARROW will exit the clear both bulbs command without clearing the bulb "A" or bulb "B" hours values. To exit the utilities menu, press the *Display* button.

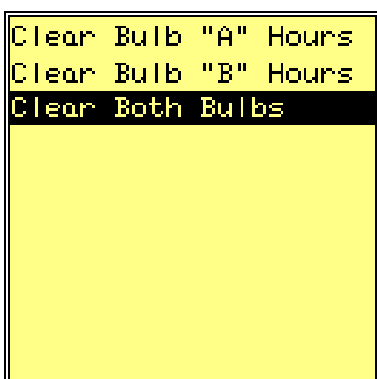


Figure 571

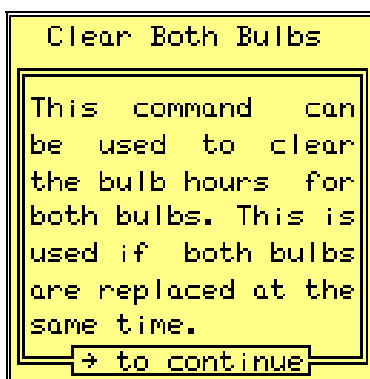


Figure 572

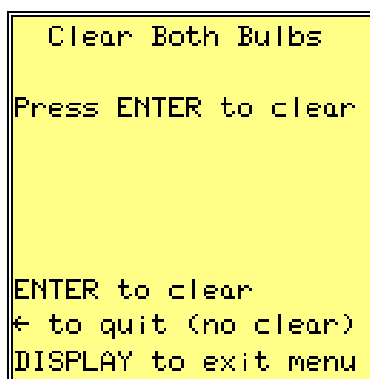


Figure 573

PLOT BULB "A" LOG

The plot bulb "A" hours command can be used to plot the bulb "A" hours values. When the bulb hours value is reset, the previous value is placed in the bulb "A" hours log. With the cursor on the "Plot Bulb "A" Log" menu item (see Figure 574), pressing the RIGHT ARROW will display the bulb "A" log help screen (see Figure 575). Pressing the RIGHT ARROW button again will move past the help screen to the "Bulb "A" Log" display (see Figure 576). Pressing the LEFT ARROW will exit the bulb "A" log display. When the plot is present, the UP ARROW and DOWN ARROW buttons can be used to scroll horizontally. The plot shows 95 of the 128 values in the log. The RIGHT ARROW button will toggle the left hand scale between the maximum value on the plot and the maximum value allowed. To exit the utilities menu, press the *Display* button.

SERVICE MENU

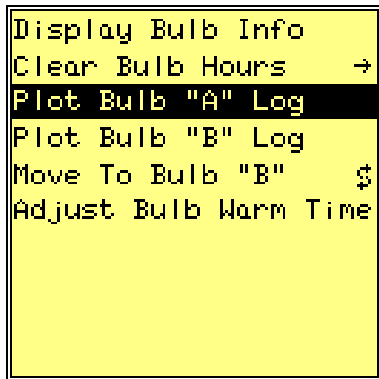


Figure 574

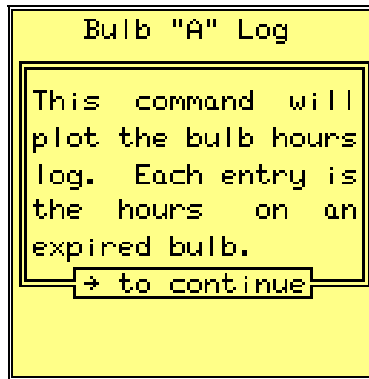


Figure 575

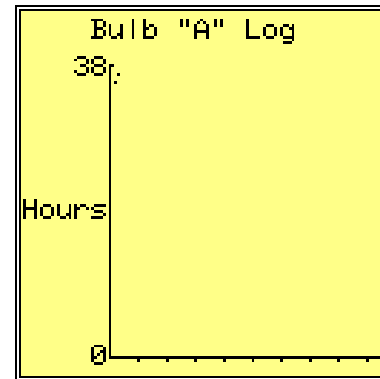


Figure 576

PLOT BULB "B" LOG

The plot bulb "B" hours command can be used to plot the bulb "B" hours values. When the bulb hours value is reset, the previous value is placed in the bulb "B" hours log. With the cursor on the "Plot Bulb "B" Log" menu item (see Figure 577), pressing the RIGHT ARROW will display the bulb "B" log help screen (see Figure 578). Pressing the RIGHT ARROW button again will move past the help screen to the "Bulb "B" Log" display (see Figure 579). Pressing the LEFT ARROW will exit the bulb "B" log display. When the plot is present, the UP ARROW and DOWN ARROW buttons can be used to scroll horizontally. The plot shows 95 of the 128 values in the log. The RIGHT ARROW button will toggle the left hand scale between the maximum value on the plot and the maximum value allowed. To exit the utilities menu, press the *Display* button.

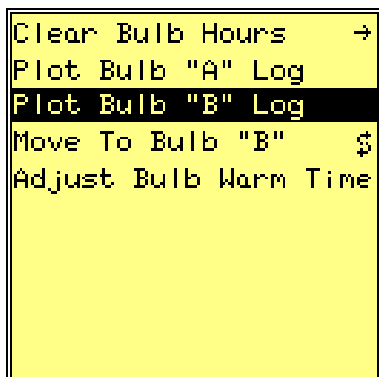


Figure 577

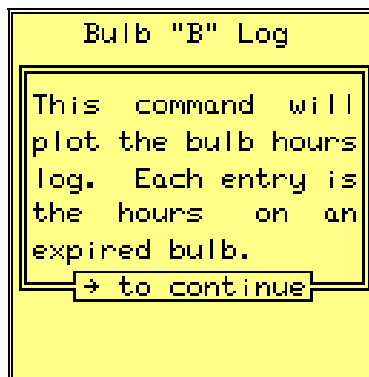


Figure 578

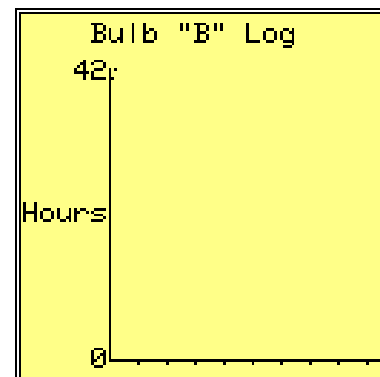


Figure 579

SERVICE MENU

MOVE TO BULB "A" / MOVE TO BULB "B"

This menu item can be used to select the currently active bulb. With the cursor on the "Move To Bulb "A"" menu item (see Figure 580), pressing the *Enter* button will change the menu item to "Move To Bulb "B"". Likewise, with the cursor on the "Move To Bulb "B"" menu item (see Figure 581), pressing the *Enter* button will change the menu item to "Move To Bulb "A"". This is a toggle entry as indicated by the double arrow symbol at the end of the menu item. When "Move To Bulb "A"" is selected, the light source back-up mechanism will move to bulb "A". When "Move To Bulb "B"" is selected, the light source back-up mechanism will move to bulb "B". If the Illumination surgical function is enabled, the illuminated bulb will extinguish and the selected bulb will illuminate.

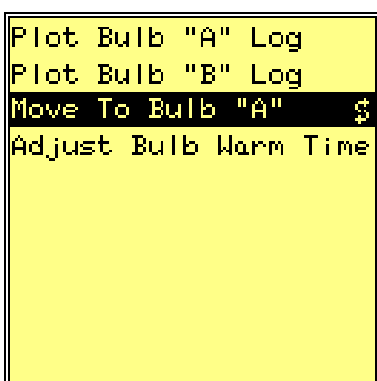


Figure 580

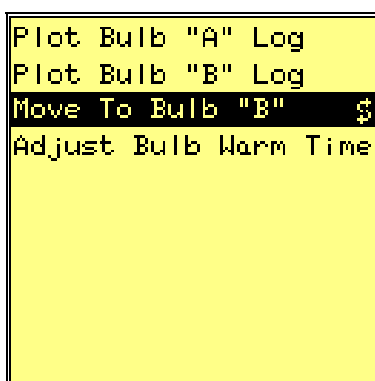


Figure 581

ADJUST BULB WARM TIME

The adjust bulb warm time command can be used to set the length of time the bulb will warm, before being turned on. With the cursor on the "Adjust Bulb Warm Time" menu item (see Figure 582), pressing the RIGHT ARROW will display the bulb warm time help screen (see Figure 583). Pressing the RIGHT ARROW button again will move past the help screen to the "Bulb Warm Time" command (see Figure 584). The UP ARROW and DOWN ARROW buttons are used to increase and decrease the bulb warm time. Pressing the *Enter* button will save the displayed value in the active configuration and exit the bulb warm time command. Pressing the LEFT ARROW will discard any changes made and restore the bulb warm time to its previous value. To exit the utilities menu, press the *Display* button.

SERVICE MENU

```
Plot Bulb "B" Log
Move To Bulb "B" $
Adjust Bulb Warm Time
```

Figure 582

```
Bulb Warm Time

This command can be
used to change the
bulb warm time.
→ to continue
```

Figure 583

```
Bulb Warm Time

1500 mSec

↑↓ to change value
ENTER to save & exit
← to quit (no save)
DISPLAY to exit menu
```

Figure 584

SERVICE PNEUMATICS

The service pneumatics menu has items used to service the pneumatics module. With the cursor on the "Service Pneumatics" menu item (see Figure 585), pressing the RIGHT ARROW button will display the service pneumatics menu list (see Figure 586). At the top of the display, the text SERVICE PNEUMATICS indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position.

```
Disable Keyboard
Service Illumination→
Service Pneumatics →
Calibration Routines→
Adjust Custom Style →
Read Analog Board
Read Ultrasound Board
```

Figure 585

```
←SERVICE PNEUMATICS
Display Pump Hours
Display Valve Counts
Clear Pump Hours →
Clear Valve Counters→
Plot Pressure Log
Plot Vacuum Log
Pick Pressure Source→
Pick Vacuum Source →
```

Figure 586

DISPLAY PUMP HOURS

The display pump hours command can be used to display the pump hours values. With the cursor on the "Display Pump Hours" menu item (see Figure 586), pressing the RIGHT ARROW will display the pump hours help screen (see Figure 587). Pressing the RIGHT ARROW button again will move past the help

SERVICE MENU

screen to the “Pump Hours” display (see Figure 588). Pressing the LEFT ARROW will exit the display pump hours command. To exit the utilities menu, press the *Display* button.

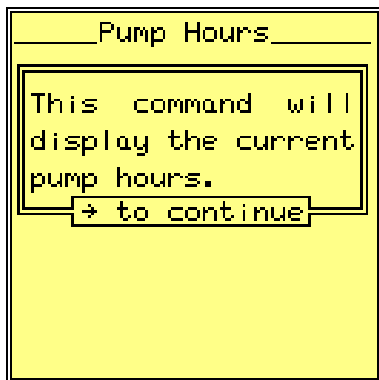


Figure 587

A screenshot of a terminal window titled "Pump Hours" showing a list of pump types and their corresponding hours.

Pressure Pump	77
Vacuum Pump	72
Air Exchange	25

Figure 588

DISPLAY VALVE COUNTS

The display valve counts command can be used to display the valve counters. With the cursor on the “Display Valve Counts” menu item (see Figure 589), pressing the RIGHT ARROW will display the valve counters help screen (see Figure 590). Pressing the RIGHT ARROW button again will move past the help screen to the “Valve Counters” display (see Figure 591). Pressing the LEFT ARROW will exit the display valve counts command. To exit the utilities menu, press the *Display* button.

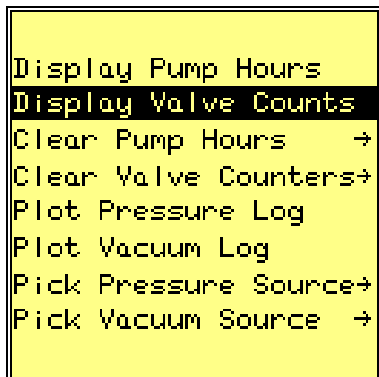


Figure 589

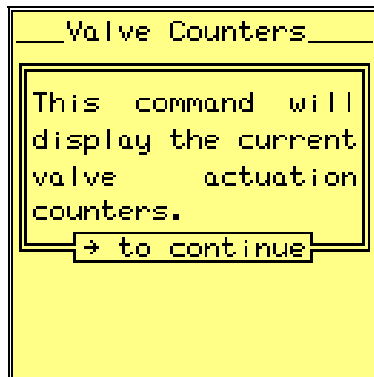


Figure 590

A screenshot of a terminal window titled "Valve Counters" showing a list of valve types and their corresponding counts.

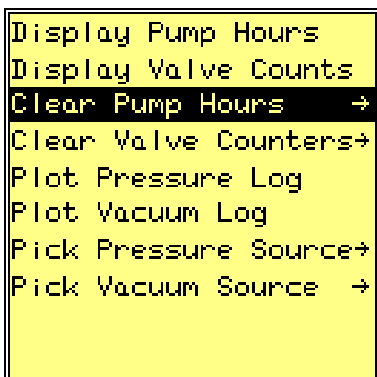
Aspiration	2694
Reflux	1432
Irrigation	1882
Vitrector	345457
Air Exchange	2474
Bulb Backup	1696

Figure 591

SERVICE MENU

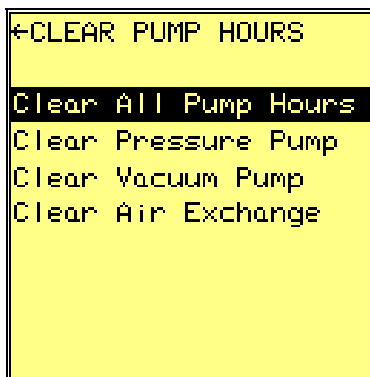
CLEAR PUMP HOURS

The clear pump hours menu has items used to clear the pump hours after servicing the pneumatics module. With the cursor on the “Clear Pump Hours” menu item (see Figure 592), pressing the RIGHT ARROW button will display the clear pump hours menu list (see Figure 593). At the top of the display, the text CLEAR PUMP HOURS indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position.



```
Display Pump Hours
Display Valve Counts
Clear Pump Hours →
Clear Valve Counters→
Plot Pressure Log
Plot Vacuum Log
Pick Pressure Source→
Pick Vacuum Source →
```

Figure 592



```
←CLEAR PUMP HOURS
Clear All Pump Hours
Clear Pressure Pump
Clear Vacuum Pump
Clear Air Exchange
```

Figure 593

CLEAR ALL PUMP HOURS

The clear all pump hours command will clear the pump timers for all the pumps on the pneumatics module. With the cursor on the “Clear All Pump Hours” menu item (see Figure 593), pressing the RIGHT ARROW button will display the clear all pump hours help screen (see Figure 594). Pressing the RIGHT ARROW button again will move past the help screen to the “Clear All Pump Hours” command (see Figure 595). Pressing the *Enter* button will clear the pump timers for all of the pumps. Pressing the LEFT ARROW will exit the clear all pump hours command without clearing the pump timers. To exit the utilities menu, press the *Display* button.

SERVICE MENU

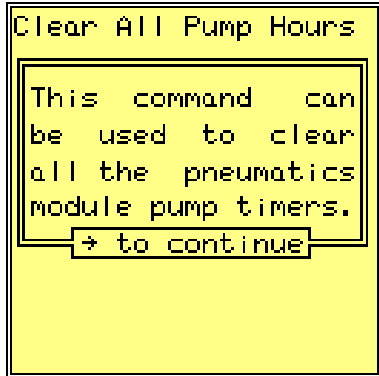


Figure 594

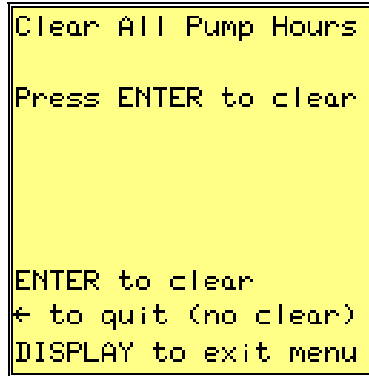


Figure 595

CLEAR PRESSURE PUMP

The clear pressure pump command will clear the pump timer for the pressure pump on the pneumatics module. With the cursor on the “Clear Pressure Pump” menu item (see Figure 596), pressing the RIGHT ARROW button will display the clear pressure pump help screen (see Figure 597). Pressing the RIGHT ARROW button again will move past the help screen to the “Clear Pressure Pump” command (see Figure 598). Pressing the *Enter* button will clear the timer for the pressure pump. Pressing the LEFT ARROW will exit the clear pressure pump command without clearing the pump timer. To exit the utilities menu, press the *Display* button.

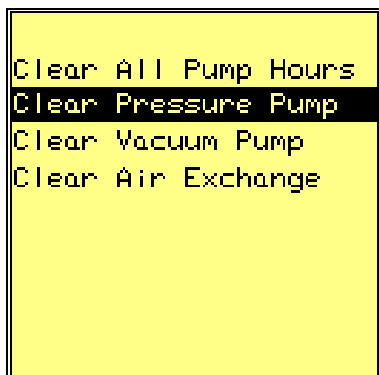


Figure 596

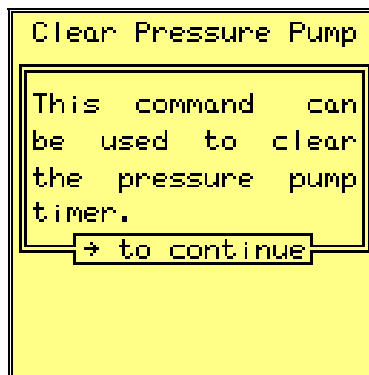


Figure 597

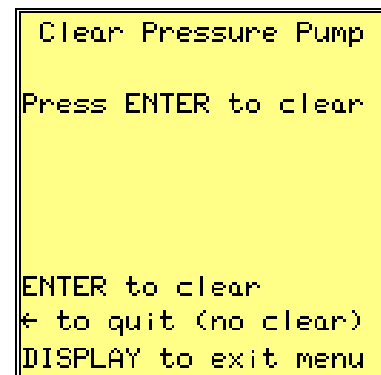


Figure 598

CLEAR VACUUM PUMP

The clear vacuum pump command will clear the pump timer for the vacuum pump on the pneumatics module. With the cursor on the “Clear Vacuum Pump” menu item (see Figure 599), pressing the RIGHT ARROW button will display the

SERVICE MENU

clear vacuum pump help screen (see Figure 600). Pressing the RIGHT ARROW button again will move past the help screen to the “Clear Vacuum Pump” command (see Figure 601). Pressing the *Enter* button will clear the timer for the vacuum pump. Pressing the LEFT ARROW will exit the clear vacuum pump command without clearing the pump timer. To exit the utilities menu, press the *Display* button.

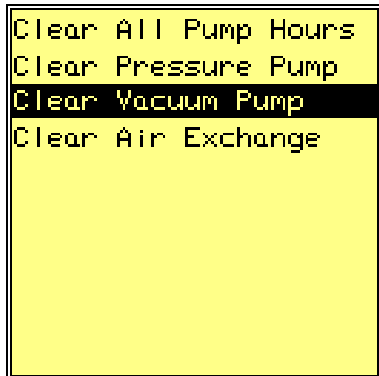


Figure 599

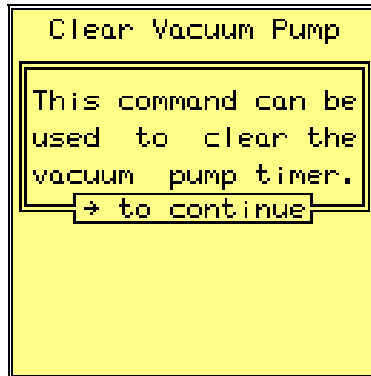


Figure 600

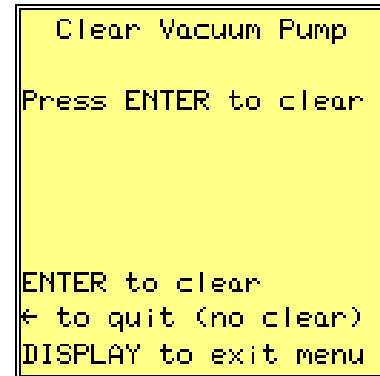


Figure 601

CLEAR AIR EXCHANGE

The clear air exchange command will clear the pump timer for the air exchange pump on the pneumatics module. With the cursor on the “Clear Air Exchange” menu item (see Figure 602), pressing the RIGHT ARROW button will display the clear air exchange help screen (see Figure 603). Pressing the RIGHT ARROW button again will move past the help screen to the “Clear Air Exchange” command (see Figure 604). Pressing the *Enter* button will clear the timer for the air exchange pump. Pressing the LEFT ARROW will exit the clear air exchange command without clearing the pump timer. To exit the utilities menu, press the *Display* button.

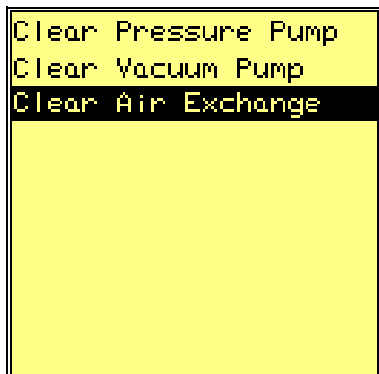


Figure 602

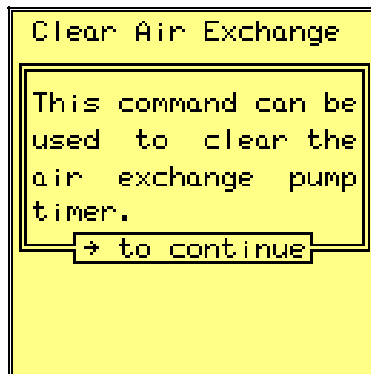


Figure 603

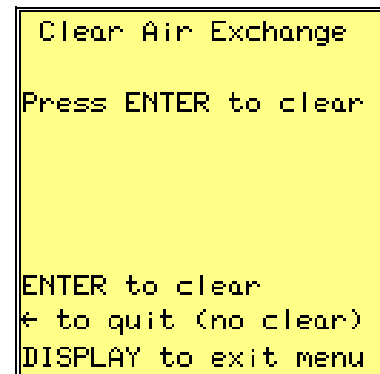


Figure 604

SERVICE MENU

CLEAR VALVE COUNTERS

The clear valve counters menu has items used to clear the valve actuation counters after servicing the pneumatics module. With the cursor on the “Clear Valve Counters” menu item (see Figure 605), pressing the RIGHT ARROW button will display the clear valve counters menu list (see Figure 606). At the top of the display, the text CLEAR VALVE COUNTERS indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position.

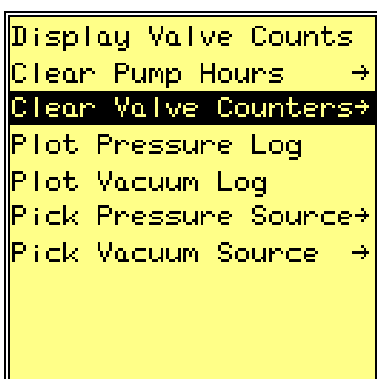


Figure 605

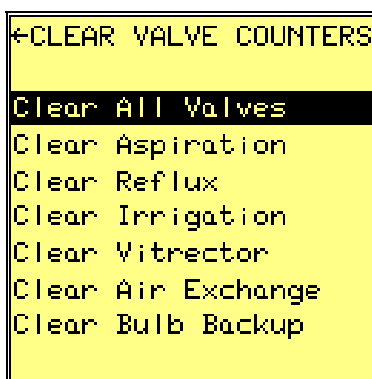


Figure 606

CLEAR ALL VALVES

The clear all valves command will clear the valve actuation counters for all the valves on the pneumatics module. With the cursor on the “Clear All Valves” menu item (see Figure 606), pressing the RIGHT ARROW button will display the clear all valves help screen (see Figure 607). Pressing the RIGHT ARROW button again will move past the help screen to the “Clear All Valves” command (see Figure 608). Pressing the *Enter* button will clear the valve actuation counters for all of the valves. Pressing the LEFT ARROW will exit the clear all valves command without clearing the valve actuation counters. To exit the utilities menu, press the *Display* button.

SERVICE MENU

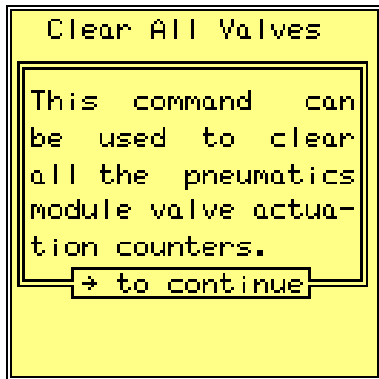


Figure 607

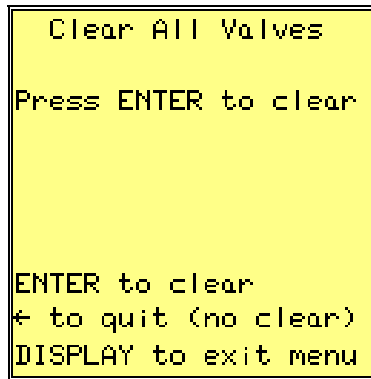


Figure 608

CLEAR ASPIRATION

The clear aspiration command will clear the valve actuation counter for the aspiration valve on the pneumatics module. With the cursor on the “Clear Aspiration” menu item (see Figure 609), pressing the RIGHT ARROW button will display the clear aspiration help screen (see Figure 610). Pressing the RIGHT ARROW button again will move past the help screen to the “Clear Aspiration” command (see Figure 611). Pressing the *Enter* button will clear the valve actuation counter for the aspiration valve. Pressing the LEFT ARROW will exit the clear aspiration command without clearing the valve actuation counter. To exit the utilities menu, press the *Display* button.

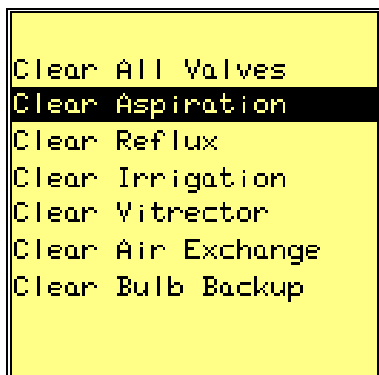


Figure 609

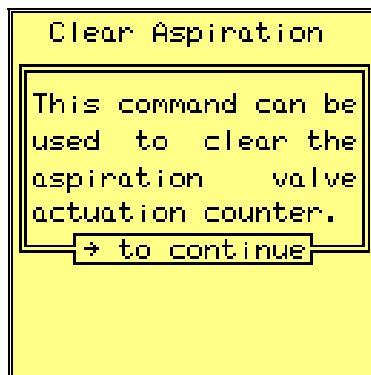


Figure 610

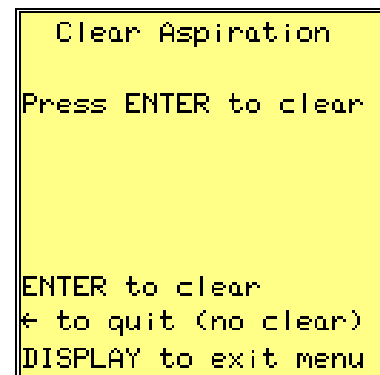


Figure 611

SERVICE MENU

CLEAR REFLUX

The clear reflux command will clear the valve actuation counter for the reflux valve on the pneumatics module. With the cursor on the “Clear Reflux” menu item (see Figure 612), pressing the RIGHT ARROW button will display the clear reflux help screen (see Figure 613). Pressing the RIGHT ARROW button again will move past the help screen to the “Clear Reflux” command (see Figure 614). Pressing the *Enter* button will clear the valve actuation counter for the reflux valve. Pressing the LEFT ARROW will exit the clear reflux command without clearing the valve actuation counter. To exit the utilities menu, press the *Display* button.

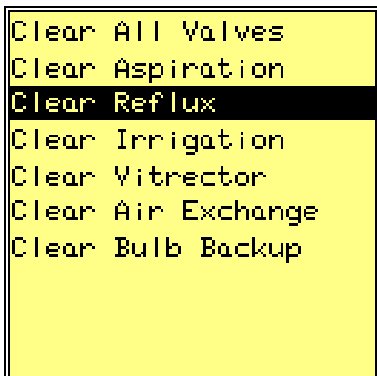


Figure 612

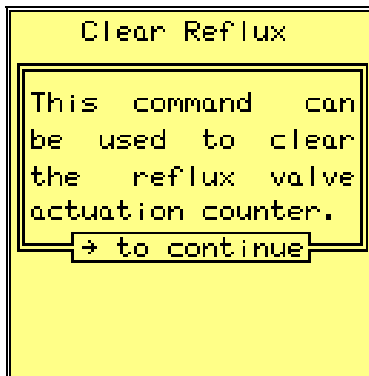


Figure 613

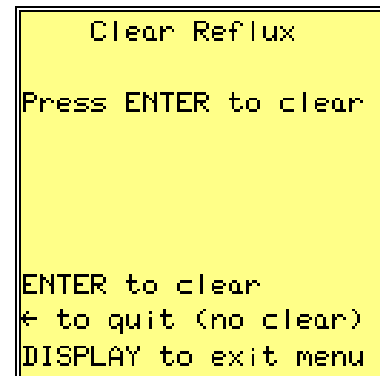
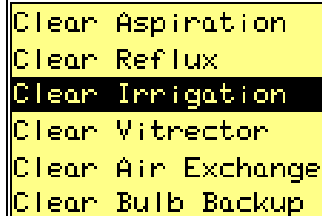


Figure 614

CLEAR IRRIGATION

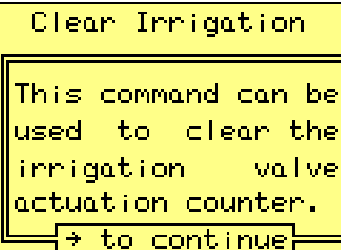
The clear irrigation command will clear the valve actuation counter for the irrigation valve on the pneumatics module. With the cursor on the “Clear Irrigation” menu item (see Figure 615), pressing the RIGHT ARROW button will display the clear irrigation help screen (see Figure 616). Pressing the RIGHT ARROW button again will move past the help screen to the “Clear Irrigation” command (see Figure 617). Pressing the *Enter* button will clear the valve actuation counter for the irrigation valve. Pressing the LEFT ARROW will exit the clear irrigation command without clearing the valve actuation counter. To exit the utilities menu, press the *Display* button.

SERVICE MENU



```
Clear Aspiration
Clear Reflux
Clear Irrigation
Clear Vitrector
Clear Air Exchange
Clear Bulb Backup
```

Figure 615

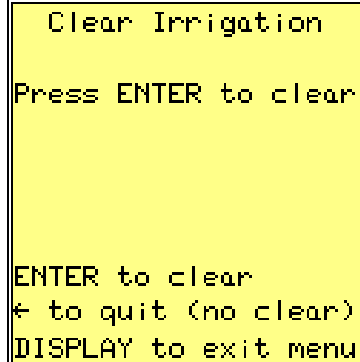


```
Clear Irrigation

This command can be
used to clear the
irrigation valve
actuation counter.

→ to continue
```

Figure 616



```
Clear Irrigation

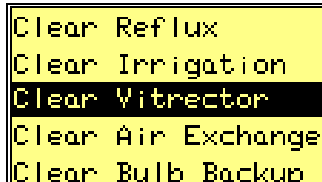
Press ENTER to clear

ENTER to clear
← to quit (no clear)
DISPLAY to exit menu
```

Figure 617

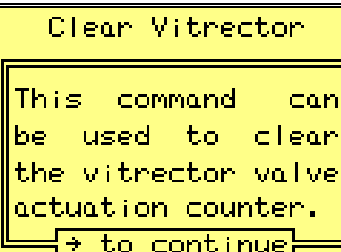
CLEAR VITRECTOR

The clear vitrector command will clear the valve actuation counter for the vitrector valve on the pneumatics module. With the cursor on the “Clear Vitrector” menu item (see Figure 618), pressing the RIGHT ARROW button will display the clear vitrector help screen (see Figure 619). Pressing the RIGHT ARROW button again will move past the help screen to the “Clear Vitrector” command (see Figure 620). Pressing the *Enter* button will clear the valve actuation counter for the vitrector valve. Pressing the LEFT ARROW will exit the clear vitrector command without clearing the valve actuation counter. To exit the utilities menu, press the *Display* button.



```
Clear Reflux
Clear Irrigation
Clear Vitrector
Clear Air Exchange
Clear Bulb Backup
```

Figure 618

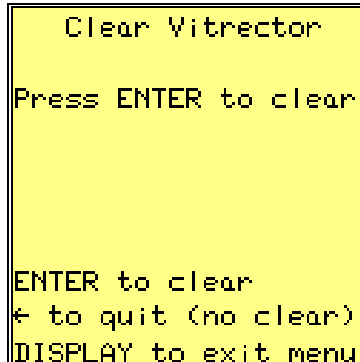


```
Clear Vitrector

This command can
be used to clear
the vitrector valve
actuation counter.

→ to continue
```

Figure 619



```
Clear Vitrector

Press ENTER to clear

ENTER to clear
← to quit (no clear)
DISPLAY to exit menu
```

Figure 620

SERVICE MENU

CLEAR AIR EXCHANGE

The clear air exchange command will clear the valve actuation counter for the air exchange valve on the pneumatics module. With the cursor on the “Clear Air Exchange” menu item (see Figure 621), pressing the RIGHT ARROW button will display the clear air exchange help screen (see Figure 622). Pressing the RIGHT ARROW button again will move past the help screen to the “Clear Air Exchange” command (see Figure 623). Pressing the *Enter* button will clear the valve actuation counter for the air exchange valve. Pressing the LEFT ARROW will exit the clear air exchange command without clearing the valve actuation counter. To exit the utilities menu, press the *Display* button.

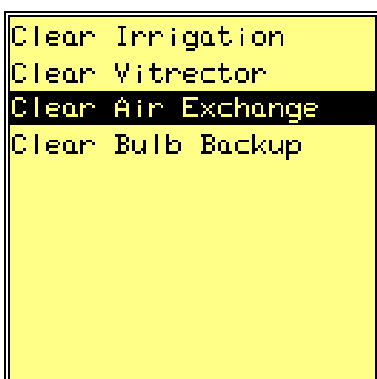


Figure 621

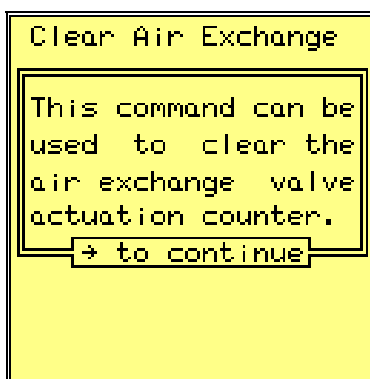


Figure 622

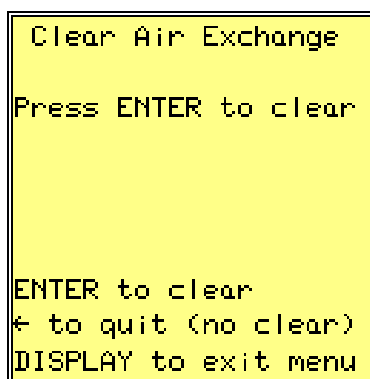


Figure 623

CLEAR BULB BACKUP

The clear bulb backup command will clear the valve actuation counter for the bulb backup valve on the pneumatics module. With the cursor on the “Clear Bulb Backup” menu item (see Figure 624), pressing the RIGHT ARROW button will display the clear bulb backup help screen (see Figure 625). Pressing the RIGHT ARROW button again will move past the help screen to the “Clear Bulb Backup” command (see Figure 626). Pressing the *Enter* button will clear the valve actuation counter for the bulb backup valve. Pressing the LEFT ARROW will exit the clear bulb backup command without clearing the valve actuation counter. To exit the utilities menu, press the *Display* button.

SERVICE MENU

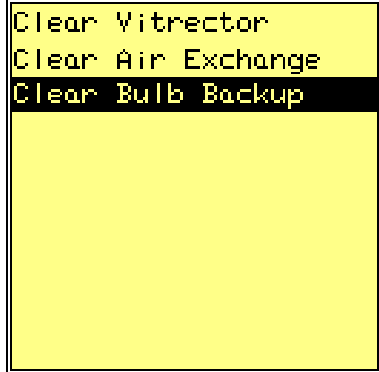


Figure 624

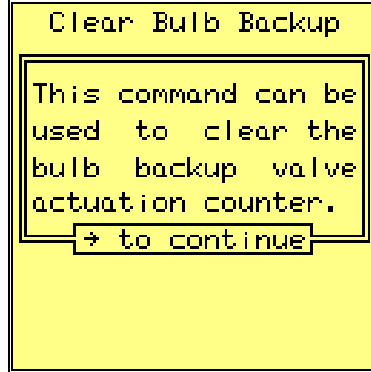


Figure 625

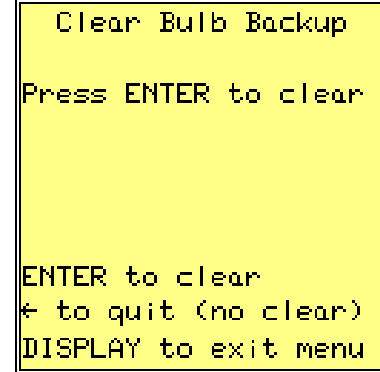


Figure 626

PLOT PRESSURE LOG

The plot pressure log command can be used to plot the pressure log for the pressure pump. Every 100 hours of operation, the pressure of the pressure pump is placed in to the log. With the cursor on the “Plot Pressure Log” menu item (see Figure 627), pressing the RIGHT ARROW will display the pressure pump log help screen (see Figure 628). Pressing the RIGHT ARROW button again will move past the help screen to the “Pressure Pump Log” display (see Figure 629). Pressing the LEFT ARROW will exit the plot pressure pump display. When the plot is present, the UP ARROW and DOWN ARROW buttons can be used to scroll horizontally. The plot shows 95 of the 128 values in the log. The RIGHT ARROW button will toggle the left hand scale between the maximum value on the plot and the maximum value allowed. To exit the utilities menu, press the *Display* button.

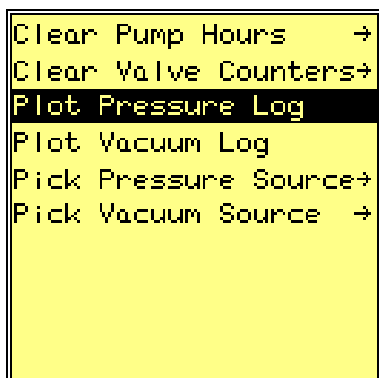


Figure 627

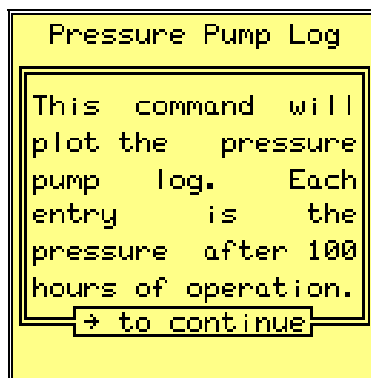


Figure 628

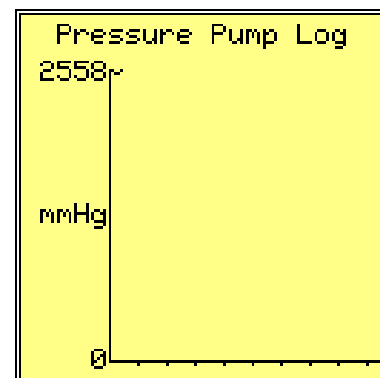


Figure 629

SERVICE MENU

PLOT VACUUM LOG

The plot vacuum log command can be used to plot the pressure log for the vacuum pump. Every 100 hours of operation, the pressure of the vacuum pump is placed in to the log. With the cursor on the “Plot Vacuum Log” menu item (see Figure 630), pressing the RIGHT ARROW will display the vacuum pump log help screen (see Figure 631). Pressing the RIGHT ARROW button again will move past the help screen to the “Vacuum Pump Log” display (see Figure 632). Pressing the LEFT ARROW will exit the plot vacuum pump display. When the plot is present, the UP ARROW and DOWN ARROW buttons can be used to scroll horizontally. The plot shows 95 of the 128 values in the log. The RIGHT ARROW button will toggle the left hand scale between the maximum value on the plot and the maximum value allowed. To exit the utilities menu, press the *Display* button.

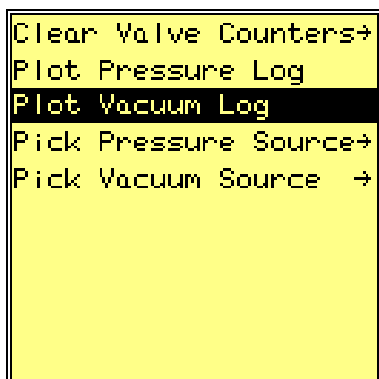


Figure 630

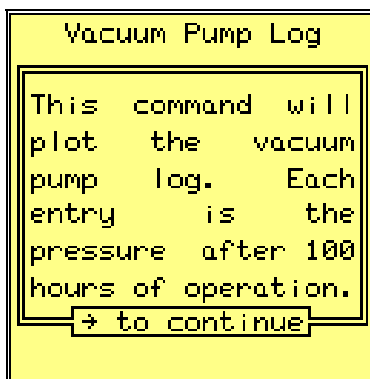


Figure 631

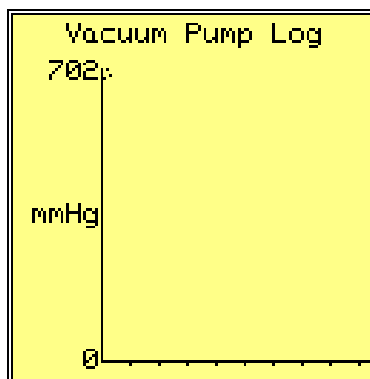


Figure 632

PICK PRESSURE SOURCE

The pick pressure source command can be used to select the source of system pressure. Three options are available. If the internal compressor entry is selected, the internal pressure compressor will be enabled. If the external pressure entry is selected the internal pressure compressor will be disabled and the user is required to connect an external source of pressure. If the auto select entry is selected the internal compressor will be enabled if an external source of pressure is not detected. With the cursor on the “Pick Pressure Source” menu item (see Figure 633), pressing the RIGHT ARROW will display the pick pressure source help screen (see Figure 634). This help screen describes how to select an item from a list. Pressing the RIGHT ARROW button again will move past the help screen to the “Pick Pressure Source” list (see Figure 635). The currently selected item is marked with an asterisk. Using the UP ARROW and DOWN ARROW buttons, move the cursor to the desired item and press *Enter*. The asterisk will move the newly selected item. To exit this list press the LEFT

SERVICE MENU

ARROW button. To exit the utilities menu, press the *Display* button. The factory default for the pressure source is the internal compressor.

```
Plot Pressure Log
Plot Vacuum Log
Pick Pressure Source→
Pick Vacuum Source →
```

Figure 633

```
←PICK PRESSURE SOURCE

To select an item
from the following
list, move the bar
to the desired item
and press ENTER.
The * will move to
the selected item.

→ to continue
```

Figure 634

```
←PICK PRESSURE SOURCE

Internal Compressor *
External Pressure
Auto Select
```

Figure 635

PICK VACUUM SOURCE

The pick vacuum source command can be used to select the source of system vacuum. Three options are available. If the internal pump entry is selected, the internal vacuum pump will be enabled. If the external vacuum entry is selected the internal vacuum pump will be disabled and the user is required to connect an external source of vacuum. If the auto select entry is selected the internal vacuum pump will be enabled if an external source of vacuum is not detected. With the cursor on the "Pick Vacuum Source" menu item (see Figure 636), pressing the RIGHT ARROW will display the pick vacuum source help screen (see Figure 637). This help screen describes how to select an item from a list. Pressing the RIGHT ARROW button again will move past the help screen to the "Pick Vacuum Source" list (see Figure 638). The currently selected item is marked with an asterisk. Using the UP ARROW and DOWN ARROW buttons, move the cursor to the desired item and press *Enter*. The asterisk will move the newly selected item. To exit this list press the LEFT ARROW button. To exit the utilities menu, press the *Display* button. The factory default for the pressure source is the internal vacuum pump.

SERVICE MENU

```
Plot Vacuum Log
Pick Pressure Source→
Pick Vacuum Source →
```

Figure 636

```
*PICK VACUUM SOURCE

To select an item
from the following
list, move the bar
to the desired item
and press ENTER.
The * will move to
the selected item.

→ to continue
```

Figure 637

```
*PICK VACUUM SOURCE
Internal Pump *
External Vacuum
Auto Select
```

Figure 638

CALIBRATION ROUTINES

The calibration routines menu has items used to calibrate the device. With the cursor on the “Calibration Routines” menu item (see Figure 639), pressing the RIGHT ARROW button will display the calibration routines menu list (see Figure 640). At the top of the display, the text CALIBRATION ROUTINES indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position.

```
Service Illumination→
Service Pneumatics →
Calibration Routines→
Adjust Custom Style →
Read Analog Board
Read Ultrasound Board
```

Figure 639

```
*CALIBRATION ROUTINES
Calibrate Foot Pedal
Maximum Aspiration
Plot Aspiration Table
Air Exchange Pump
Plot Air Exchange D/A
Plot Air Exchange A/D
Cassette Detection
```

Figure 640

CALIBRATE FOOT PEDAL

The calibrate foot pedal command can be used to calibrate the foot pedal. If a new foot pedal is attached, or if the linear functions (aspiration or ultrasound) do not appear to be reaching their maximum values, then the foot pedal may need to be calibrated. With the cursor on the “Calibrate Foot Pedal” menu item (see Figure 640), pressing the RIGHT ARROW will display the calibrate foot pedal help screen (see Figure 641). Pressing the RIGHT ARROW button again will move past the help screen to the “Calibrate Foot Pedal” command (see Figure 642). This screen tells the user to hold the foot pedal down and press *Enter*. When asked to hold down the foot pedal, only sufficient pressure necessary to move the foot pedal to its full extent is required. Excessive pressure is not desired. When the foot pedal is pressed, the position of the foot pedal is dynamically displayed (see Figure 643). After the *Enter* button is pressed, the user is instructed to lift the foot pedal and press *Enter* (see Figure 644). After lifting the foot pedal and pressing *Enter*, the user is instructed to hold down the foot pedal and press *Enter* (see Figure 645). After holding down the foot pedal and pressing *Enter*, the user is instructed to lift the foot pedal and press *Enter* (see Figure 646). After lifting the foot pedal and pressing *Enter*, the calibration is complete (see Figure 647). Pressing the LEFT ARROW at any point during calibration, subsequent to completion, will terminate the calibrate foot pedal command without changing the current calibration data. To exit the utilities menu, press the *Display* button. If the calibration process is unsuccessful, the message “Calibration problem” will be displayed in place of “Calibration complete”. The calibration process requires that the foot pedal be depressed two times. Calibration will be unsuccessful if the full pedal depression percentage differs by more than one percent. If calibration is unsuccessful, try again.

The calibrate foot pedal command can also be used to diagnose foot pedal problems. The display also shows the state of the three switches in the foot pedal. The foot pedal down switch state is indicated to the upper right of the bar graph. When the foot pedal is depressed, the word “Down” will appear (see Figure 643). The foot pedal left switch state is indicated to the lower left of the bar graph. The word “Left” will appear when the foot pedal is rotated to the left (see Figure 648). Likewise, the right foot pedal switch state is indicated below and to the right of the bar graph. The word “Right” will appear when the foot pedal is rotated to the right (see Figure 649). Pressing the LEFT ARROW will terminate the calibrate foot pedal command without changing the current calibration data.

SERVICE MENU

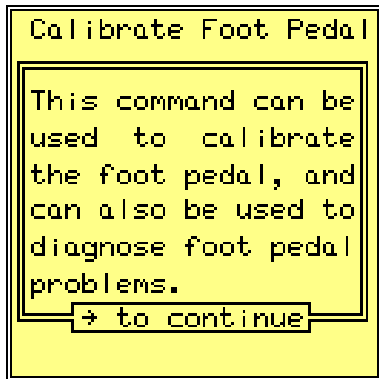


Figure 641

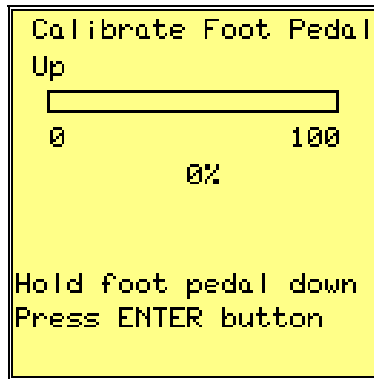


Figure 642

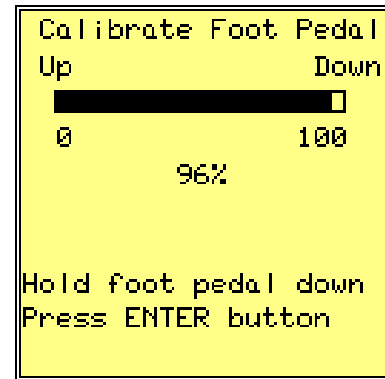


Figure 643

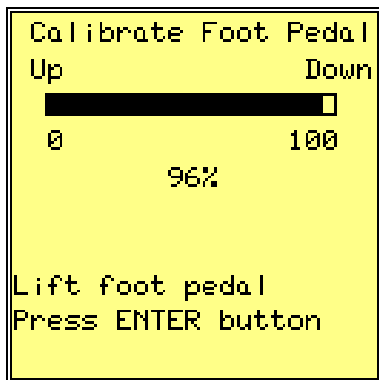


Figure 644

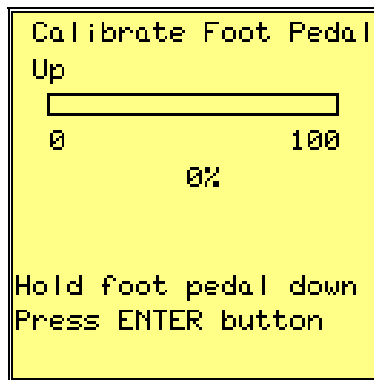


Figure 645

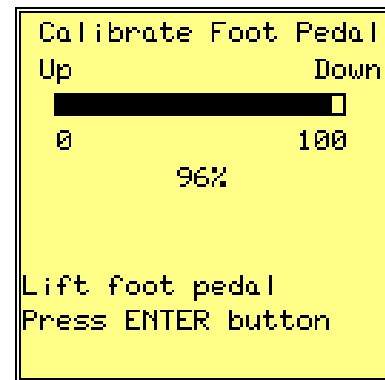


Figure 646

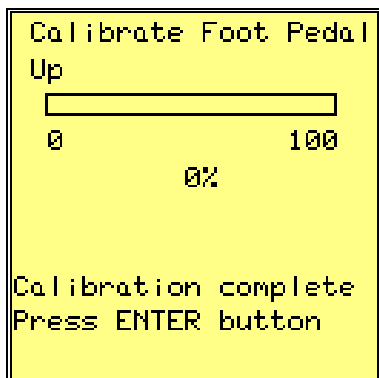


Figure 647

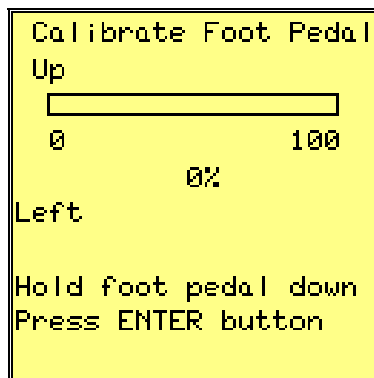


Figure 648

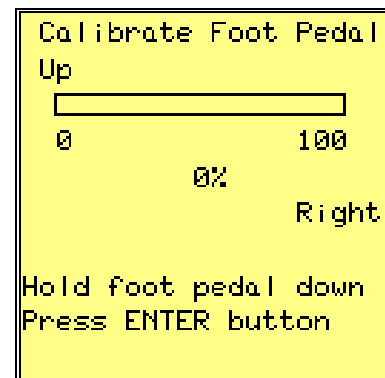


Figure 649

SERVICE MENU

MAXIMUM ASPIRATION

The maximum aspiration command can be used to calibrate the aspiration section of the pneumatics module. If a new pneumatics module is installed, or if aspiration does not appear to be functioning correctly, then maximum aspiration may need to be calibrated. With the cursor on the "Maximum Aspiration" menu item (see Figure 650), pressing the RIGHT ARROW will display the calibrate aspiration help screen (see Figure 651). Pressing the RIGHT ARROW button again will move past the help screen to the "Calibrate Aspiration" command (see Figure 652). This screen tells the user to insert a cassette, plug the aspiration input and press *Enter*. After *Enter* is pressed several error conditions are checked for, any of which will terminate the calibration process. The aspiration surgical function must be off. This reduces the chance of accidental calibration during surgery. The foot pedal must be in the rest position. Any pressure on the foot pedal will terminate the calibration process. The large vacuum chamber must have an acceptable vacuum level. Any leaks in the vacuum system will affect calibration. The small vacuum chamber is then evacuated and its vacuum must also be acceptable. If none of the error conditions exist, the calibration process will begin. While calibrating, the desired vacuum level, the current vacuum level and the elapsed time will be displayed (see Figure 653). Pressing the LEFT ARROW will terminate the calibrate aspiration command, however, the calibration data collected up to that point will be saved. Once calibration is complete the *Enter* button will need to be pressed again (see Figure 654).

Several error conditions will be displayed when appropriate. If the aspiration surgical function is on, the message "Aspiration is on" will be displayed. If the LEFT ARROW is pressed, the message "Aborted by user" will be displayed. If no aspiration cassette is detected, the message "No cassette present" will be displayed. If the vacuum level is below acceptable limits, the message "Low vacuum level" will be displayed. If the user depresses the foot pedal or activates the left or right switch, the message "Foot pedal active" will be displayed.

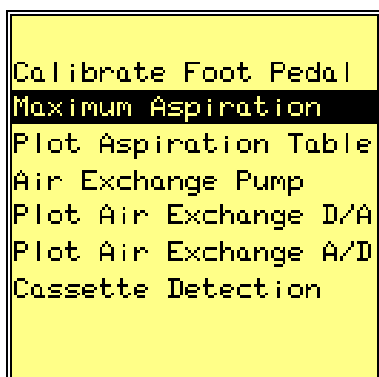


Figure 650

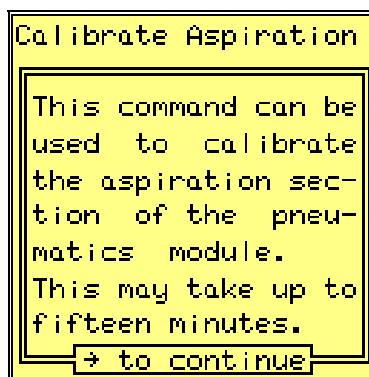


Figure 651

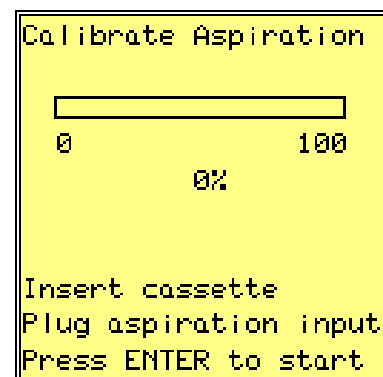


Figure 652

SERVICE MENU

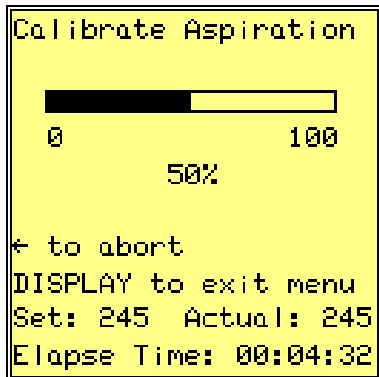


Figure 653

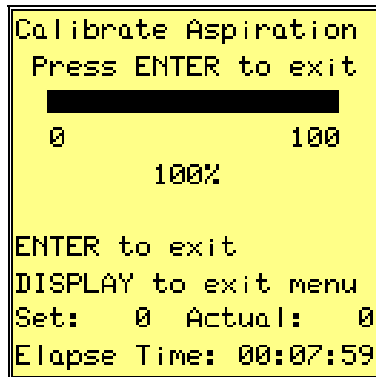


Figure 654

PLOT ASPIRATION TABLE

The plot aspiration table command can be used to plot the maximum aspiration table generated when the maximum aspiration is calibrated. With the cursor on the "Plot Aspiration Table" menu item (see Figure 655), pressing the RIGHT ARROW will display the aspiration table help screen (see Figure 656). Pressing the RIGHT ARROW button again will move past the help screen to the "Aspiration Table" display (see Figure 657). Pressing the LEFT ARROW will exit the aspiration table display. When the plot is present, the UP ARROW and DOWN ARROW buttons can be used to scroll horizontally. The plot shows 95 of the 128 values in the log. The RIGHT ARROW button will toggle the left hand scale between the maximum value on the plot and the maximum value allowed. To exit the utilities menu, press the *Display* button.

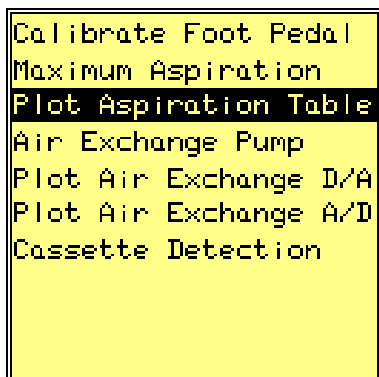


Figure 655

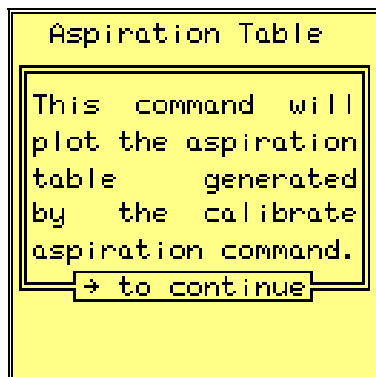


Figure 656

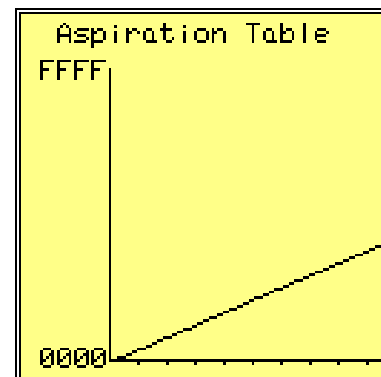


Figure 657

SERVICE MENU

AIR EXCHANGE PUMP

The air exchange pump command can be used to calibrate the air exchange pump on the pneumatics module. If a new pneumatics module is installed, or if the air exchange does not appear to be functioning correctly, then the air exchange pump may need to be calibrated. With the cursor on the “Air Exchange Pump” menu item (see Figure 658), pressing the RIGHT ARROW will display the calibrate air pump help screen (see Figure 659). Pressing the RIGHT ARROW button again will move past the help screen to the “Calibrate Air Pump” command (see Figure 660). Pressing the *Enter* button will start the air exchange calibration process. After *Enter* is pressed several error conditions are checked for, any of which will terminate the calibration process. The air exchange surgical function must be off. This reduces the chance of accidental calibration during surgery. The current eye pressure must be zero. If neither of the error conditions exist, the calibration process will begin. While calibrating, the desired pressure level, the current pressure level and the elapsed time will be displayed (see Figure 661). Pressing the LEFT ARROW will terminate the calibrate air pump command, however, the calibration data collected up to that point will be saved. Once calibration is complete the *Enter* button will need to be pressed again (see Figure 662).

Several error conditions will be displayed when appropriate. If the air exchange surgical function is on, the message “Air exchange is on” will be displayed. If the LEFT ARROW is pressed, the message “Aborted by user” will be displayed. If eye pressure is detected, the message “Eye pressure detected” will be displayed. If the air exchange pump fuse opens, the message “Air pump fuse problem” will be displayed.

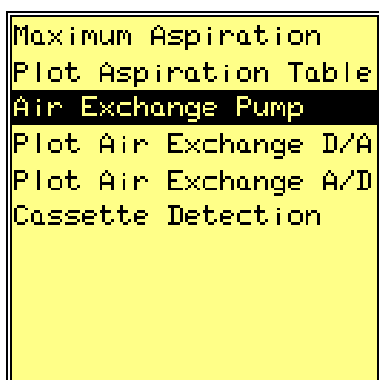


Figure 658

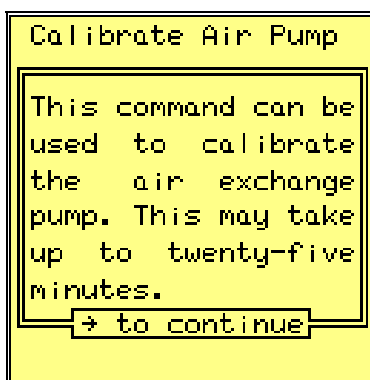


Figure 659

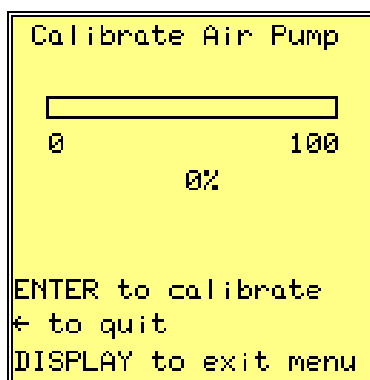


Figure 660

SERVICE MENU

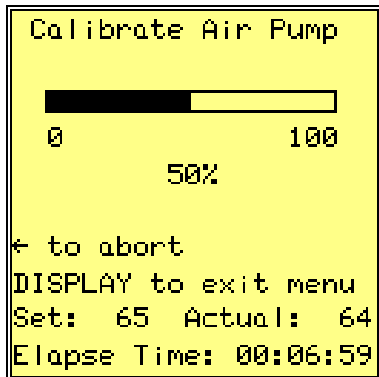


Figure 661

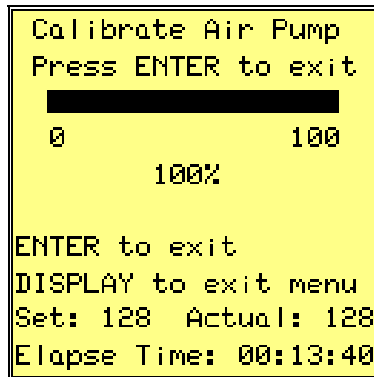


Figure 662

PLOT AIR EXCHANGE D/A

The plot air exchange D/A command can be used to plot the air exchange table generated when the air exchange pump is calibrated. This table is the D/A value required to generate the pressures from one to 128 mmHg. With the cursor on the “Plot Air Exchange D/A” menu item (see Figure 663), pressing the RIGHT ARROW will display the air exchange table help screen (see Figure 664). Pressing the RIGHT ARROW button again will move past the help screen to the “Air Exchange Table” display (see Figure 665). Pressing the LEFT ARROW will exit the air exchange table display. When the plot is present, the UP ARROW and DOWN ARROW buttons can be used to scroll horizontally. The plot shows 95 of the 128 values in the log. The RIGHT ARROW button will toggle the left hand scale between the maximum value on the plot and the maximum value allowed. To exit the utilities menu, press the *Display* button.

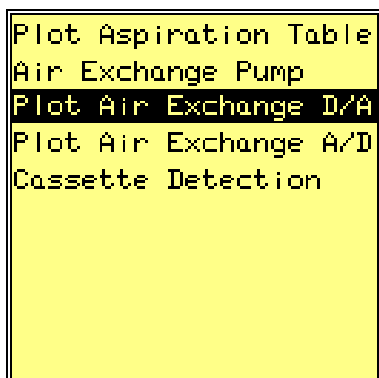


Figure 663

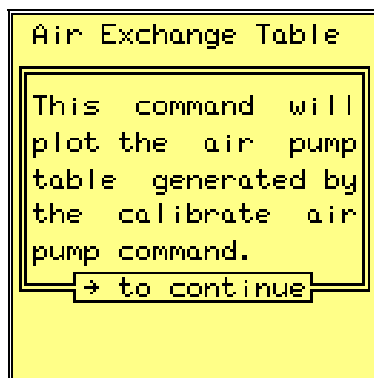


Figure 664

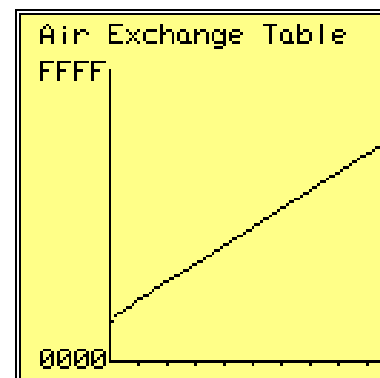


Figure 665

SERVICE MENU

PLOT AIR EXCHANGE A/D

The plot air exchange A/D command can be used to plot the air exchange voltage table generated when the air exchange pump is calibrated. This table is the pump voltage read while generating pressures from one to 128 mmHg. With the cursor on the “Plot Air Exchange A/D” menu item (see Figure 666), pressing the RIGHT ARROW will display the air exchange voltage help screen (see Figure 667). Pressing the RIGHT ARROW button again will move past the help screen to the “Air Exchange Voltage” display (see Figure 668). Pressing the LEFT ARROW will exit the air exchange voltage display. When the plot is present, the UP ARROW and DOWN ARROW buttons can be used to scroll horizontally. The plot shows 95 of the 128 values in the log. The RIGHT ARROW button will toggle the left hand scale between the maximum value on the plot and the maximum value allowed. To exit the utilities menu, press the *Display* button.

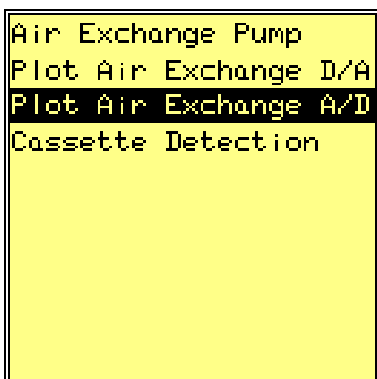


Figure 666

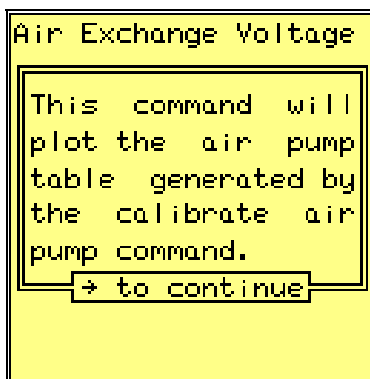


Figure 667

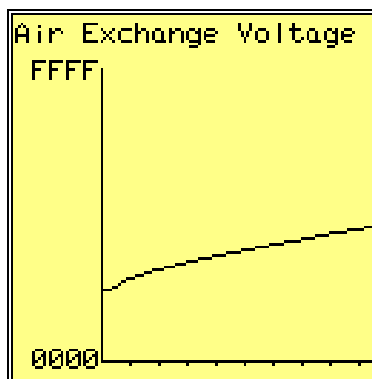


Figure 668

CASSETTE DETECTION

The calibrate cassette detection logic command can be used to determine cassette detection energy threshold level. If energy above the threshold level is detected on the cassette level LEDs then a cassette is present in the cassette chamber. If a cassette is present in the cassette chamber, but not properly aligned, then the user is reminded to re-align the cassette. With the cursor on the “Cassette Detection” menu item (see Figure 669), pressing the RIGHT ARROW will display the cassette detection help screen (see Figure 670). Pressing the RIGHT ARROW button again will move past the help screen to the “Cassette Detection” command (see Figure 671). The calibrate cassette detection command requires the aspiration cassette to be completely removed from the cassette chamber and the aspiration surgical function to be turned off. If a cassette is present or if the aspiration surgical function is on, the calibrate cassette detection command will terminate. To start the calibration process press the *Enter* button. To exit, press the LEFT ARROW button. Once started, the command will display the current threshold as it is running (see Figure 672)

SERVICE MENU

and may be terminated by pressing the LEFT ARROW button. Once completed (see Figure 673), the new threshold level may be placed into effect by pressing the *Enter* button or may be discarded by pressing the LEFT ARROW button. To exit the utilities menu, press the *Display* button at any time.

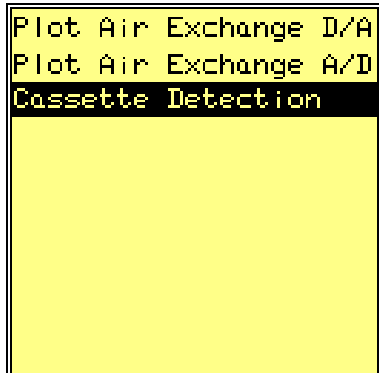


Figure 669

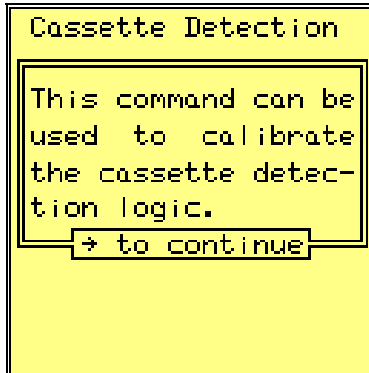


Figure 670

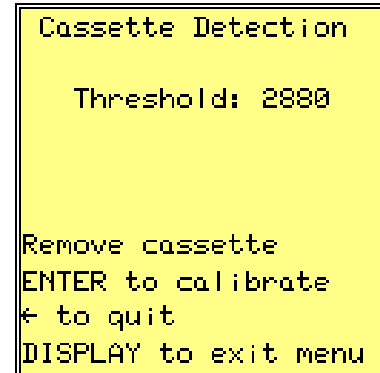


Figure 671

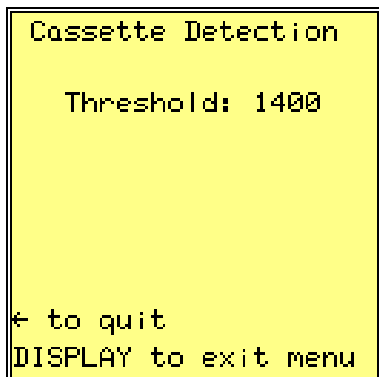


Figure 672

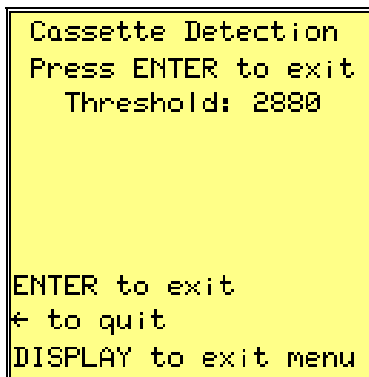


Figure 673

ADJUST CUSTOM STYLE

The adjust custom style menu has items used to select modification the vitrector pulse width parameters. With the cursor on the "Adjust Custom Style" menu item (see Figure 674), pressing the RIGHT ARROW button will display the adjust custom style menu list (see Figure 675). At the top of the display, the text ADJUST CUSTOM STYLE indicates the previous menu selection text. The left arrow preceding the text indicates pressing the LEFT ARROW will move back to the previous menu list. The LEFT ARROW button will move back to the previous list regardless of the current cursor position.

SERVICE MENU

```
Service Pneumatics →  
Calibration Routines→  
Adjust Custom Style →  
Read Analog Board  
Read Ultrasound Board
```

Figure 674

```
*ADJUST CUSTOM STYLE  
For Vitrector  
For Scissors
```

Figure 675

FOR VITRECTOR

The adjust custom style for vitrector command can be used to modify the pulse width values used when the vitrector custom style is selected. The vitrector custom style pulse width parameters may be selected for use by using the Pick Vitrector Style menu (see page 145). With the cursor on the “For Vitrector” menu item (see Figure 675), pressing the RIGHT ARROW will display the adjust custom style help screen (see Figure 676). Pressing the RIGHT ARROW button again will move past the help screen to the “Adjust Custom Style” display (see Figure 677). The box around the “1.” text is the adjust custom style cursor. The UP ARROW and DOWN ARROW buttons will move the cursor up and down, to allow cut rate/pulse width pair selection. Once the cursor is on the pair to adjust, the RIGHT ARROW will move the cursor to the cut rate parameters value (see Figure 678). With the cursor on the cut rate value, the UP ARROW and DOWN ARROW buttons will change the cut rate value, and the LEFT ARROW will return the cursor to allow pair selection. With the cursor on the cut rate parameter, the RIGHT ARROW button will move the cursor to the pulse width value (see Figure 679). The UP ARROW and DOWN ARROW buttons will change the pulse width value. The LEFT ARROW button will return the cursor to the cut rate value and the RIGHT ARROW button will replace the help text with the current values for the cut rate and pulse width (see Figure 680). With the cursor selecting the fourth pair, pressing the DOWN ARROW button will present the next four pairs for adjustment (see Figure 681). With the cursor selecting the eighth pair, pressing the DOWN ARROW button will select Max Rate parameter for adjustment. Once all of the desired modifications have been made, press the *Enter* button to save the changes. If the LEFT ARROW button is pressed while the cursor is in the left column, the adjust custom style command is terminated. If any parameters were modified and termination is selected, a warning screen will display (see Figure 682). If the LEFT ARROW is pressed, any changes will be lost. If the *Enter* button is pressed, the changes will be saved. To exit the utilities menu, press the *Display* button.

SERVICE MENU

Adjust Custom Style

This command can be used to change the vitrector cutting parameters for the Custom Style entry in the Pick Vitrector Style menu.

→ to continue

Figure 676

Adjust Custom Style

1. 700 CPM 25.0 mS
2. 1200 CPM 25.0 mS
3.
4.
Max Rate 1200 CPM
← to quit (no save)
↑↓ for next parameter
→ move to value field
DISPLAY to exit menu

Figure 677

Adjust Custom Style

1. 700 CPM 25.0 mS
2. 1200 CPM 25.0 mS
3.
4.
Max Rate 1200 CPM
← to select parameter
↑↓ to change value
→ move to value field
ENTER to save & exit

Figure 678

Adjust Custom Style

1. 700 CPM 25.0 mS
2. 1200 CPM 25.0 mS
3.
4.
Max Rate 1200 CPM
← move to value field
↑↓ to change value
→ show current values
ENTER to save & exit

Figure 679

Adjust Custom Style

1. 700 CPM 25.0 mS
2. 1200 CPM 25.0 mS
3.
4.
Max Rate 1200 CPM
Modifier 0.00 mSec
____ Current ____
Cut Rate 600 CPM
Width 25.00 mSec

Figure 680

Adjust Custom Style

5.
6.
7.
8.
Max Rate 1200 CPM
← to quit (no save)
↑↓ for next parameter
→ move to value field
DISPLAY to exit menu

Figure 681

Adjust Custom Style

Modifications were made to the value, and not saved. If you wish to save the changes, press ENTER now.

← to continue

Figure 682

SERVICE MENU

FOR SCISSORS

The adjust custom style for scissors command can be used to modify the pulse width values used when the scissors custom style is selected. The scissors custom style pulse width parameters may be selected for use by using the Pick Scissors Style menu (see page 148). With the cursor on the “For Scissors” menu item (see Figure 683), pressing the RIGHT ARROW will display the adjust custom style help screen (see Figure 684). Pressing the RIGHT ARROW button again will move past the help screen to the “Adjust Custom Style” display (see Figure 685). The box around the “1.” text is the adjust custom style cursor. The UP ARROW and DOWN ARROW buttons will move the cursor up and down, to allow cut rate/pulse width pair selection. Once the cursor is on the pair to adjust, the RIGHT ARROW will move the cursor to the cut rate parameters value (see Figure 686). With the cursor on the cut rate value, the UP ARROW and DOWN ARROW buttons will change the cut rate value, and the LEFT ARROW will return the cursor to allow pair selection. With the cursor on the cut rate parameter, the RIGHT ARROW button will move the cursor to the pulse width value (see Figure 687). The UP ARROW and DOWN ARROW buttons will change the pulse width value. The LEFT ARROW button will return the cursor to the cut rate value and the RIGHT ARROW button will replace the help text with the current values for the cut rate and pulse width (see Figure 688). With the cursor selecting the forth pair, pressing the DOWN ARROW button will present the next four pairs for adjustment (see Figure 689). With the cursor selecting the eighth pair, pressing the DOWN ARROW button will select Max Rate parameter for adjustment. Once all of the desired modifications have been made, press the *Enter* button to save the changes. If the LEFT ARROW button is pressed while the cursor is in the left column, the adjust custom style command is terminated. If any parameters were modified and termination is selected, a warning screen will display (see Figure 690). If the LEFT ARROW is pressed, any changes will be lost. If the *Enter* button is pressed, the changes will be saved. To exit the utilities menu, press the *Display* button.

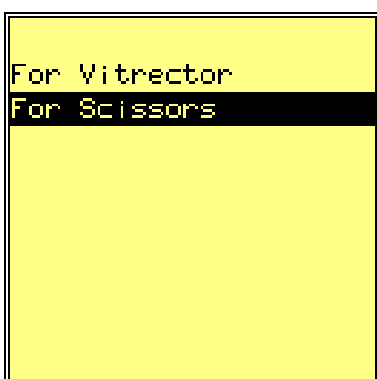


Figure 683

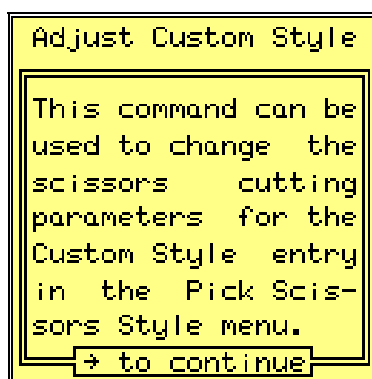


Figure 684

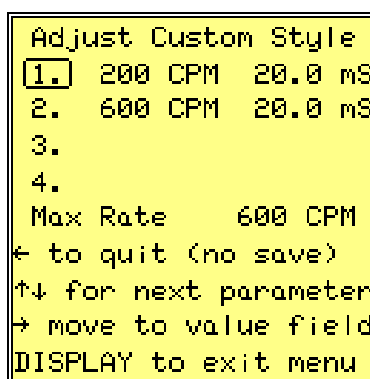


Figure 685

SERVICE MENU

```

Adjust Custom Style
1. 200 CPM 20.0 mS
2. 600 CPM 20.0 mS
3.
4.
Max Rate      600 CPM
← to select parameter
↑↓ to change value
→ move to value field
ENTER to save & exit
    
```

Figure 686

```

Adjust Custom Style
1. 200 CPM 20.0 mS
2. 600 CPM 20.0 mS
3.
4.
Max Rate      600 CPM
← move to value field
↑↓ to change value
→ show current values
ENTER to save & exit
    
```

Figure 687

```

Adjust Custom Style
1. 200 CPM 20.0 mS
2. 600 CPM 20.0 mS
3.
4.
Max Rate      600 CPM
Modifier      0.00 mSec
Current
Cut Rate      200 CPM
Width         20.00 mSec
    
```

Figure 688

```

Adjust Custom Style
5.
6.
7.
8.
Max Rate      600 CPM
← to quit (no save)
↑↓ for next parameter
→ move to value field
DISPLAY to exit menu
    
```

Figure 689

```

Adjust Custom Style
Modifications were
made to the value,
and not saved.  If
you wish to save
the changes, press
ENTER now.
← to continue
    
```

Figure 690

READ ANALOG BOARD

The read analog board command can be used to read the serial EEPROM on the analog board. The serial EEPROM is used to save calibration data, specific to an individual analog board and determined at the time of manufacture. If a new analog board is installed, and detected by the VitMan, the contents of the serial EEPROM is automatically read and placed into effect. This command can be used to determine if a communication problem exists between the CPU board and the analog board. With the cursor on the "Read Analog Board" menu item (see Figure 691), pressing the RIGHT ARROW will display the read analog board help screen (see Figure 692). Pressing the RIGHT ARROW button again will move past the help screen to the "Read Analog Board" command (see Figure 693). Pressing the *Enter* button will start the read of the analog board serial EEPROM. While the read is in progress, the bar graph will indicate the percentage complete (see Figure 694). Once the read is complete, the *Enter* button will need to be pressed again (see Figure 695). Several error conditions may prevent a successful read. If a communications problem exists, the error message "Serial EEPROM problem" will be displayed. If the contents of the

SERVICE MENU

serial EEPROM has an invalid check sum, the message “Invalid check sum” will be displayed.

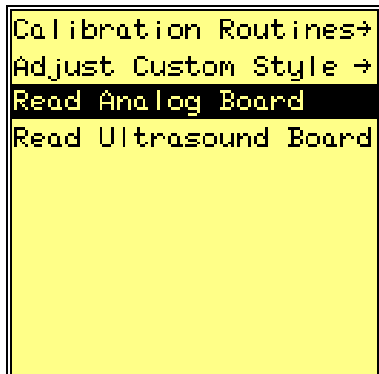


Figure 691

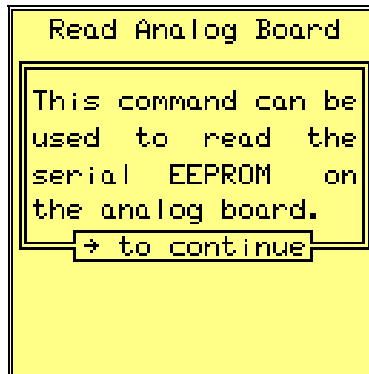


Figure 692

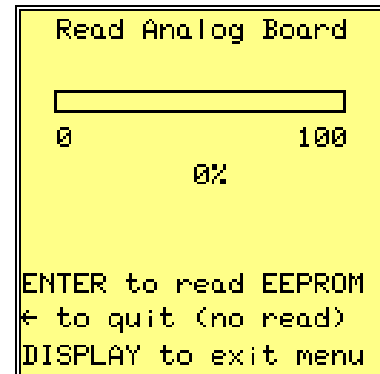


Figure 693

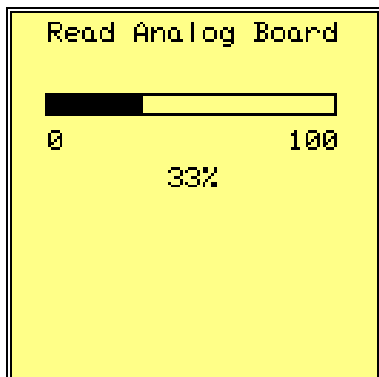


Figure 694

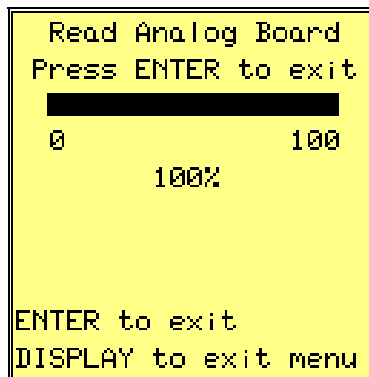


Figure 695

READ ULTRASOUND BOARD

The read ultrasound board command can be used to read the serial EEPROM on the ultrasound board. Note that some versions of the ultrasound electronics do not have a serial EEPROM. The serial EEPROM is used to save calibration data, specific to an individual ultrasound board and determined at the time of manufacture. If a new ultrasound board is installed, and detected by the VitMan, the contents of the serial EEPROM is automatically read and placed into effect. This command can be used to determine if a communication problem exists between the CPU board and the ultrasound board. With the cursor on the “Read Ultrasound Board” menu item (see Figure 696), pressing the RIGHT ARROW will display the read ultrasound board help screen (see Figure 697). If no serial EEPROM is present, pressing the RIGHT ARROW button again will move past the help screen and display the “No serial EEPROM is present” text (see Figure 701). If the serial EEPROM is present, pressing the RIGHT ARROW button

SERVICE MENU

again will move past the help screen to the “Read Ultrasound Board” command (see Figure 698). Pressing the *Enter* button will start the read of the ultrasound board serial EEPROM. While the read is in progress, the bar graph will indicate the percentage complete (see Figure 699). Once the read is complete, the *Enter* button will need to be pressed again (see Figure 700). Several error conditions may prevent a successful read. If a communications problem exists, the error message “Serial EEPROM problem” will be displayed. If the contents of the serial EEPROM has an invalid check sum, the message “Invalid check sum” will be displayed.

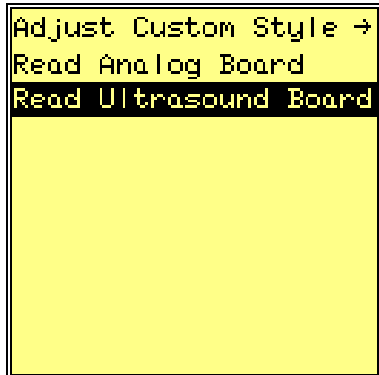


Figure 696

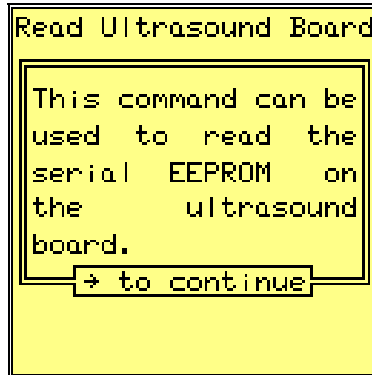


Figure 697

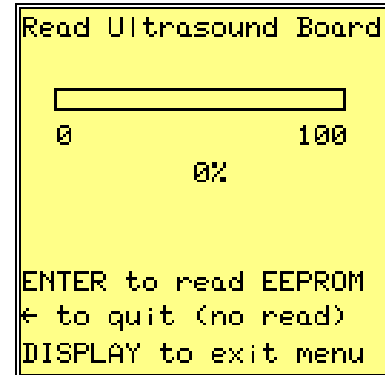


Figure 698

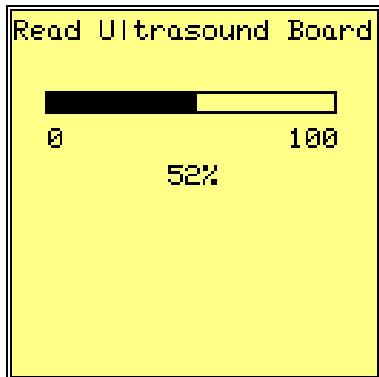


Figure 699

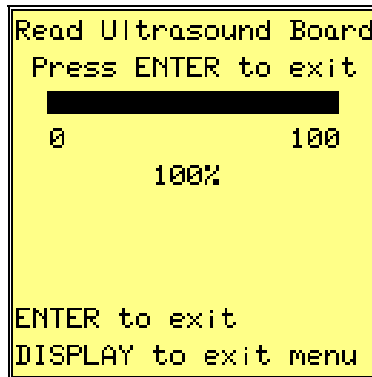


Figure 700

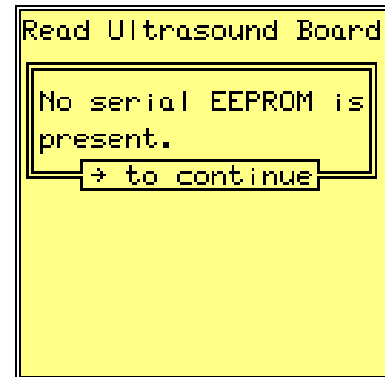


Figure 701

Appendix B: STATUS LINE MESSAGES

The status line of the LCD display will show information concerning the current state of the device. All error and warning conditions will generate a status line message. In addition to error and warning messages, informational messages are displayed as well. This list contains all types of status line messages, sorted in alphabetical order. Following each message is an explanation of, and in some cases a possible solution to, the condition being reported.

dd-mmm-yy hh:mm:ss

The date and time will display when the date & time is selected for the status line default and no other messages need to be displayed. The status line default may be selected using the “Status Line Default” command in the “Display” menu. The date and time can be modified using the “Date & Time” menu, found in the main menu. The date and time are used to time stamp any files created.

Dr. Cutright

The user name will display when the user name is selected for the status line default and no other messages need to be displayed. The status line default may be selected using the “Status Line Default” command in the “Display” menu. The user name can be modified using the “Edit User Name” command, found in the “Select User” menu.

+12 volt fuse problem

The +12 volt fuse on the analog board has opened. This fuse is resettable, powering the VitMan off and then on may clear the problem.

-12 volt fuse problem

The -12 volt fuse on the analog board has opened. This fuse is resettable, powering the VitMan off and then on may clear the problem.

-22 volt fuse problem

The -22 volt fuse on the analog board has opened. This fuse is resettable, powering the VitMan off and then on may clear the problem.

500cc sensor problem

The vacuum sensor used to monitor the vacuum pump pressure is indicating a problem. If the aspiration cassette is present and the vacuum level is zero or if the aspiration cassette is missing and pressure is present, this message will be displayed in the status line. This message may appear along with the “Low vacuum level”, “Check cassette tubing” and “Please lock cassette” messages, when the aspiration cassette is present but not locked.

STATUS LINE MESSAGES

50cc sensor problem

The vacuum sensor used to monitor the small chamber of the aspiration cassette is indicating a problem. If the aspiration cassette is present and the vacuum level is zero (when vacuum should be present) or if the aspiration cassette is missing and pressure is present, this message will be displayed in the status line.

Air exchange xxx mmHg

While the desired air exchange pressure is modified, the current eye pressure will be displayed in the status line, where “xxx” is the value of the eye pressure.

Air exchange excess

When the air exchange pressure exceeds the warning pressure limit for a time longer than the warning time limit, this message is displayed in the status line. The warning pressure limit and the warning time limit may be adjusted using the “Air Exchange Values” menu in the “Current Settings” menu.

Air exchange problem

If the air exchange valve is open, the pressure difference between the eye pressure sensor and the air exchange pump pressure sensor should be less than 15 mmHg (for low flow rate conditions the pressure difference will be close to zero mmHg). If a pressure difference of 15 mmHg or greater is detected, this message will be displayed. This message will appear along with the “Service required” message.

Air exchange set: xxx

While the air exchange surgical function is on, the pressure setting is displayed in the status line, where “xxx” is the pressure setting value in mmHg.

Air pump fuse problem

The air exchange pump fuse on the analog board has opened. This fuse is not resettable and will need to be replaced in order to clear the problem. Note: This fuse also protects the audio circuitry. The speaker will not operate if this fuse has opened.

Air pump hours excess

The run time on the air exchange pump has exceeded the maximum limit. The pneumatics module needs to be serviced. The “Display Pump Hours” command, found in the “Service Pneumatics” menu of the “Service Menu”, can be used to display the current air pump hours.

Air pump problem

The test of the air exchange pump indicates that it may not be capable of generating pressure. This message may be accompanied by the “Air pump fuse problem” or the “Service required” messages.

STATUS LINE MESSAGES

Air sensor problem

The pressure sensor used to monitor the air pump used in the air exchange surgical function is indicating a problem. If the air exchange surgical function is off and vacuum is present or if the air exchange surgical function is on and no pressure is present, this message will be displayed in the status line.

Alarm cut off

While not in the utilities menu, the ENTER button will allow alarm cut off. Pressing and releasing the ENTER button will mute any currently playing alarm or warning tone. This is normally only required when the error or warning tones are in continuous mode. The error and warning tone modes may be adjusted using the “Audio Services” menu.

Anterior Aspiration

This message indicates that the aspiration surgical function has entered anterior aspiration mode, using the aspiration on/off button.

Anterior Fixed Phaco

This message indicates that the ultrasound surgical function has entered the anterior fixed phaco mode, using the ultrasound on/off button.

Anterior Frag

This message indicates that the ultrasound surgical function has entered the anterior frag mode, using the ultrasound on/off button.

Anterior Linear Phaco

This message indicates that the ultrasound surgical function has entered the anterior linear phaco mode, using the ultrasound on/off button.

Anterior Linear Rate

This message indicates that the vitrector surgical function has entered anterior linear cut rate mode, using the vitrector on/off button.

Anterior Vitrectomy

This message indicates that the vitrector surgical function has entered the anterior vitrectomy mode, using the vitrector on/off button.

Bulb “A” FET problem

If bulb “A” is present and enabled but is not illuminated, this message will be displayed in the status line. A field effect transistor (FET) is used to sink the bulb current and illuminate the bulb. This message indicates a hardware problem that requires servicing.

Bulb “A” hours xxx

This is the in use time for bulb “A”, where “xxx” is in hours. This message will be displayed when the illumination surgical function is turned on, and the current bulb is bulb “A”.

STATUS LINE MESSAGES

Bulb “A” large hours

When the VitMan is powered up or if illumination is turned on while bulb “A” is selected, this message will be displayed if the bulb “A” hours exceed 40 hours.

Bulb “A” missing

If bulb “A” is not detected when the VitMan is powered up, this message will be displayed.

Bulb “A” open

When bulb “A” is not detected, this message will be displayed in the status line. The most likely solution is to replace the bulb.

Bulb “A” problem

If the bulb detection logic indicates bulb “A” is on, while the illumination surgical function is off, this message will be displayed in the status line.

Bulb “B” FET problem

If bulb “B” is present and enabled but is not illuminated, this message will be displayed in the status line. A field effect transistor (FET) is used to sink the bulb current and illuminate the bulb. This message indicates a hardware problem that requires servicing.

Bulb “B” hours xxx

This is the in use time for bulb “B”, where “xxx” is in hours. This message will be displayed when the illumination surgical function is turned on, and the current bulb is bulb “B”.

Bulb “B” large hours

When the VitMan is powered up or if illumination is turned on while bulb “B” is selected, this message will be displayed if the bulb “B” hours exceed 40 hours.

Bulb “B” missing

If bulb “B” is not detected when the VitMan is powered up, this message will be displayed.

Bulb “B” open

When bulb “B” is not detected this message will be displayed in the status line. The most likely solution is to replace the bulb.

Bulb “B” problem

If the bulb detection logic indicates bulb “B” is on, while the illumination surgical function is off, this message will be displayed in the status line.

Bulb fuse problem

The illumination fuse on the analog board has opened. This fuse is resettable, powering the VitMan off and then on may clear the problem.

STATUS LINE MESSAGES

Calibrate air pump

If the tables used to regulate the air exchange operation are invalid, this message will be displayed in the status line. If this message is displayed, it is recommended that the air exchange be calibrated before use. The air exchange can be calibrated using the “Calibration Routines” found in the “Service Menu”.

Calibrate aspiration

If the tables used to regulate the aspiration operation are invalid, this message will be displayed in the status line. If this message is displayed, it is recommended that the aspiration surgical function be calibrated before use. Aspiration can be calibrated using the “Calibration Routines” found in the “Service Menu”.

Calibrate foot pedal

If the values used to regulate the foot pedal operation are invalid, this message will be displayed in the status line. If this message is displayed, it is recommended that the foot pedal be calibrated before use. The foot pedal can be calibrated using the “Calibration Routines” found in the “Service Menu”.

Cassette full

If the cassette level detection logic determines that the aspiration cassette is full, this message will be displayed in the status line. This is the second level of warning and occurs after about 300 cc of fluid are aspirated.

Cassette over full

If the cassette level detection logic determines that the aspiration cassette is over full, this message will be displayed in the status line. This is the last level of warning and occurs after about 325 cc of fluid are aspirated. When this condition is detected, the vacuum pump will stop and aspiration is no longer possible. Replacement of the aspiration cassette is recommended.

Cassette position bad

If the cassette level detection logic determines that the aspiration cassette is not properly aligned, this message will be displayed in the status line. This generally indicates that the cassette is pushed into the cassette chamber prior to rotating the knob into the lock position. To correct the problem, rotate the knob to the unlocked position then back to the locked position without pressing on the cassette. The “Re-position cassette” and “Use locking knob only” messages will also be displayed.

STATUS LINE MESSAGES

Cassette problem

If a high fluid level is detected in the small chamber of the aspiration cassette, this message will be displayed in the status line. Fluid drops on the small chamber prism, or a problem with the cassette valve may cause this condition. If the cassette valve doesn't open, the high fluid level in the small chamber will eventually be detected. This condition will stop the vacuum pump and prevent the use of aspiration. If you suspect that this condition was detected in error, remove the aspiration cassette, wait for one second, and re-insert the aspiration cassette. If the condition persists, replace the aspiration cassette. The "Replace cassette" message will also be displayed.

Check cassette tubing

If the foot pedal is in the rest position and the vacuum level in the 500cc chamber falls below 400 mmHg, this message will be displayed in the status line. This may be the result of using the aspiration surgical function or requesting a prime cycle, with no tubing connected to the aspiration cassette. This message may appear along with the "Low vacuum level" and "Please lock cassette" messages.

Check external source

This message will be displayed if a problem is detected with the system pressure or vacuum level and the external connections are selected for use. If the pressure compressor mode is set to external pressure or auto select and the "Low system pressure" or "High system pressure" status line messages are displayed, this message will also be displayed. If the vacuum pump mode is set to external vacuum or auto select and the "Low vacuum level" status line message is displayed, this message will also be displayed. The most likely cause of this message is that the hose(s) are connected to the VitMan, but not to the external source of pressure (or vacuum). The user should check the external connections, and if connected, then check the external source pressure levels.

Contrast adjust

While not in the utilities menu, the LEFT ARROW and RIGHT ARROW can be used to adjust the contrast of the LCD display. This message will be displayed as the contrast is adjusted.

Currently in stage 1

When the stage button is pressed and released, the current stage will be displayed. If the current stage is stage one, this message will be displayed in the status line.

Currently in stage 2

When the stage button is pressed and released, the current stage will be displayed. If the current stage is stage two, this message will be displayed in the status line.

STATUS LINE MESSAGES

Currently in stage 3

When the stage button is pressed and released, the current stage will be displayed. If the current stage is stage three, this message will be displayed in the status line.

Currently in stage 4

When the stage button is pressed and released, the current stage will be displayed. If the current stage is stage four, this message will be displayed in the status line.

Currently in stage 5

When the stage button is pressed and released, the current stage will be displayed. If the current stage is stage five, this message will be displayed in the status line.

Currently in stage 6

When the stage button is pressed and released, the current stage will be displayed. If the current stage is stage six, this message will be displayed in the status line.

Currently in stage 7

When the stage button is pressed and released, the current stage will be displayed. If the current stage is stage seven, this message will be displayed in the status line.

Device disabled

If the internal device temperature is 55 °C or higher, this message is displayed in the status line. This message indicates an error condition and after ten seconds, the surgical functions will be affected. The illumination surgical function will be turned off. The system pressure compressor and vacuum pump will be turned off, effectively disabling aspiration, irrigation, the vitrector and the ultrasound. The air exchange surgical function will remain unaffected.

Disk available hh:mm

This is the minimum time remaining to record data on the floppy disk, where “hh” is the hours and “mm” is the minutes. After the data from the previous minute is saved on the disk, this message is displayed in the status line.

Disk space warning

If the minimum time remaining is less than 30 minutes, this message will be displayed in the status line.

Disk write protected

The write protect status of the floppy disk is checked when an attempt is made to save data on the disk. If the floppy disk is write protected, this message will be displayed in the status line.

STATUS LINE MESSAGES

Diskette is full

If no free space remains on the floppy disk, this message is displayed in the status line.

Diskette read problem

If the boot block, file allocation tables or root directory of the floppy disk cannot be read, this message is displayed in the status line. If this condition persists, the disk may need to be formatted.

Drive fuse problem

The main compressor (vitrector drive pressure) fuse on the analog board has opened. This fuse is not resettable and will need to be replaced in order to clear the problem.

Drive sensor problem

The pressure sensor used to monitor the main compressor (vitrector drive pressure) is indicating a problem. The sensor is indicating that the system pressure is zero.

Eye pressure alarm

If the air exchange surgical function is on and the current eye pressure is not within ± 5 mmHg of the current set point, this message is displayed in the status line.

Eye sensor problem

The pressure sensor used to monitor the eye pressure, for the air exchange surgical function, is indicating a problem. If the air exchange surgical function is off and vacuum is present or if the air exchange surgical function is on and no pressure is present, this message will be displayed in the status line.

Fan fuse problem

The fan fuse on the analog board has opened. This fuse is resettable, powering the VitMan off and then on may clear the problem.

Floppy fuse problem

The disk drive fuse on the analog board has opened. This fuse is resettable, powering the VitMan off and then on may clear the problem.

Foot pedal is active

When the foot pedal is active, several actions are prohibited. The user may not change the mode of the aspiration, vitrector or ultrasound surgical functions. The ultrasound handpiece may not be tuned. The aspiration valve button may not be used to open or close the aspiration valve or start a prime cycle. While in anterior mode, the irrigation valve button may not be used to open or close the irrigation valve. The stage button may not be used to change mode of the surgical functions.

STATUS LINE MESSAGES

Foot pedal problem

If the foot pedal down switch indicates that the foot pedal is up, but the foot pedal position indicates depression of 10% or more, this message will be displayed in the status line. This indicates a problem with the foot pedal down switch (internal to the foot pedal), the foot pedal cable or connector. The hardware that senses the foot pedal down switch may also have a problem.

Ground fault detected

If a ground fault is detected by the ultrasound hardware, this message will be displayed in the status line. The ground fault indicates that the ultrasound handpiece is not properly grounded. No energy will be delivered to an ungrounded ultrasound handpiece. This problem may be corrected by disconnecting and reconnecting the ultrasound handpiece. The “Service required” message will also be displayed.

High cassette level

If the cassette level detection logic determines that the aspiration cassette level is high, this message will be displayed in the status line. This is the first level of warning and occurs after about 250 cc of fluid are aspirated.

High pump pressure

If the air exchange surgical function is on and the air exchange pump pressure exceeds the current set point by more than 8 mmHg, this message is displayed in the status line.

High system pressure

If the main pressure pump pressure exceeds the upper limit, this message is displayed in the status line. This is only a warning, no surgical functions will be disabled.

High temperature xx °C

If the internal device temperature is 50 °C or higher, this message is displayed in the status line. The current temperature is “xx”. This message is only a warning and no surgical functions are effected. Under normal operating conditions, the internal temperature of the system will not reach this limit. If high temperature is detected, check for airflow restrictions around the system fan and air duct, at the rear of the system. The temperature messages may be disabled in the “Display” menu.

High vacuum level

If the aspiration surgical function is on and the 50cc vacuum level exceeds the desired level by more than 20 mmHg, this message is displayed in the status line.

STATUS LINE MESSAGES

Hold for menu mode

While not in the utilities menu, holding the DISPLAY button for one second will enter the utilities menu. If the button is released before entering the utilities menu, this message is displayed in the status line.

Hold to change bulbs

When the illumination surgical function is turned off, this message will be displayed in the status line. If the illumination surgical function is off, pressing and holding the illumination on/off button can be used to switch to the backup bulb.

Hold to enter stage 1

When the stage button is pressed and held, if stage one will be entered when the stage button is released this message will be displayed in the status line.

Hold to enter stage 2

When the stage button is pressed and held, if stage two will be entered when the stage button is released this message will be displayed in the status line.

Hold to enter stage 3

When the stage button is pressed and held, if stage three will be entered when the stage button is released this message will be displayed in the status line.

Hold to enter stage 4

When the stage button is pressed and held, if stage four will be entered when the stage button is released this message will be displayed in the status line.

Hold to enter stage 5

When the stage button is pressed and held, if stage five will be entered when the stage button is released this message will be displayed in the status line.

Hold to enter stage 6

When the stage button is pressed and held, if stage six will be entered when the stage button is released this message will be displayed in the status line.

Hold to enter stage 7

When the stage button is pressed and held, if stage seven will be entered when the stage button is released this message will be displayed in the status line.

Hold to save stage 1

When the stage button is pressed and held, this message will be displayed in the status line, prior to saving stage one. If the stage button is continued to be held, the current system state will be saved.

STATUS LINE MESSAGES

Hold to save stage 2

When the stage button is pressed and held, this message will be displayed in the status line, prior to saving stage two. If the stage button is continued to be held, the current system state will be saved.

Hold to save stage 3

When the stage button is pressed and held, this message will be displayed in the status line, prior to saving stage three. If the stage button is continued to be held, the current system state will be saved.

Hold to save stage 4

When the stage button is pressed and held, this message will be displayed in the status line, prior to saving stage four. If the stage button is continued to be held, the current system state will be saved.

Hold to save stage 5

When the stage button is pressed and held, this message will be displayed in the status line, prior to saving stage five. If the stage button is continued to be held, the current system state will be saved.

Hold to save stage 6

When the stage button is pressed and held, this message will be displayed in the status line, prior to saving stage six. If the stage button is continued to be held, the current system state will be saved.

Hold to save stage 7

When the stage button is pressed and held, this message will be displayed in the status line, prior to saving stage seven. If the stage button is continued to be held, the current system state will be saved.

Hold to start prime

When the aspiration valve button is pressed and released (but not held long enough to start the prime cycle), this message will be displayed in the status line.

LED/backlight adjust

While not in the utilities menu, the UP ARROW and DOWN ARROW can be used to adjust the intensity of the LCD display backlight and the surgical function LEDs. This message will be displayed as the intensity is adjusted.

Lift pedal to prime

To start a prime cycle the aspiration valve button must be pressed and held for 1/2 second. If the foot pedal is down when a prime cycle is started, this message will be displayed in the status line.

STATUS LINE MESSAGES

Lift pedal to reflux

If the foot pedal is depressed to a level that allows aspiration, reflux is disabled. If reflux is attempted while aspirating, this message will be displayed in the status line.

Low air pump pressure

If the air exchange surgical function is on and the air exchange pump pressure is more than 8 mmHg below the current set point, this message is displayed in the status line.

Low system pressure

If the main pressure pump pressure is below acceptable levels, this message is displayed in the status line. When low system pressure is detected the vitrector, ultrasound and aspiration surgical functions will be disabled.

Low temperature $\pm xx$ °C

If the internal device temperature is 10 °C or lower, this message is displayed in the status line. The current temperature is "xx" and when below zero will be preceded by a minus sign (-). This message is only a warning and no surgical functions are effected. The temperature messages may be disabled in the "Display" menu.

Low vacuum level

If the vacuum pump vacuum is below acceptable levels, this message is displayed in the status line. When this condition occurs aspiration is not disabled, however, not all levels of vacuum may be obtainable. This message may appear along with the "Check cassette tubing" and "Please lock cassette" messages.

Main +12 fuse problem

The Main +12 fuse on the analog board has opened. This fuse is resettable, powering the VitMan off and then on may clear the problem.

Minimum cut rate:xxxx

When the vitrector surgical function enters posterior or anterior linear rate mode this message will display the minimum cut rate, where "xxxx" is the cut rate.

No cassette present

If the aspiration cassette is not detected, this message will be displayed in the status line. While the aspiration cassette is missing, the vacuum pump is disabled and the aspiration cassette illumination is reduced.

No diskette present

Once a minute the trace data is written to the floppy disk. If no floppy disk is detected in the disk drive, this message is displayed in the status line.

STATUS LINE MESSAGES

No foot pedal present

If the foot pedal cannot be detected, this message is displayed in the status line. Without the foot pedal, many surgical functions are inoperable. Only the air exchange and illumination will function without the foot pedal.

No handpiece present

If the ultrasound surgical function is on and the handpiece is not present, this message will be displayed in the status line.

No keyboard heartbeat

If the keyboard encoder does not answer a heartbeat request, this message will be displayed in the status line. The heartbeat request is made once every second. If the heartbeat request is unanswered, the keyboard encoder is reset.

No stage selected

When the stage button is pressed and released, the current stage will be displayed. If no stage was selected, this message will be displayed in the status line.

No stages enabled

If no stages (other than the current stage) are enabled, and the stage button is pressed and held, this message will be displayed in the status line. This indicates that no stage is available as the next stage

No ultrasound present

If the ultrasound option is not present when the ultrasound on/off button is pressed, this message will be displayed in the status line.

Now saving stage 1

When the stage button is pressed and held, this message will be displayed in the status line, when the current system state is saved in stage one.

Now saving stage 2

When the stage button is pressed and held, this message will be displayed in the status line, when the current system state is saved in stage two.

Now saving stage 3

When the stage button is pressed and held, this message will be displayed in the status line, when the current system state is saved in stage three.

Now saving stage 4

When the stage button is pressed and held, this message will be displayed in the status line, when the current system state is saved in stage four.

Now saving stage 5

When the stage button is pressed and held, this message will be displayed in the status line, when the current system state is saved in stage five.

STATUS LINE MESSAGES

Now saving stage 6

When the stage button is pressed and held, this message will be displayed in the status line, when the current system state is saved in stage six.

Now saving stage 7

When the stage button is pressed and held, this message will be displayed in the status line, when the current system state is saved in stage seven.

Over temperature

If the internal device temperature is 53 °C or higher, this message is displayed in the status line. This message is only a warning and no surgical functions are effected. Under normal operating conditions, the internal temperature of the system will not reach this limit. If high temperature is detected, check for airflow restrictions around the system fan and air duct, at the rear of the system.

Overpressure detected

If the current eye pressure exceeds the warning pressure limit, this message will be displayed in the status line. The warning pressure level may be adjusted using the “Air Exchange Values” menu in the “Current Settings” menu.

Pedal fuse problem

The foot pedal fuse on the CPU board has opened. This fuse is resettable, powering the VitMan off and then on may clear the problem.

Please lock cassette

If the aspiration cassette is present and the vacuum level is below acceptable limits, this message will be displayed in the status line. This message may appear along with the “Low vacuum level” and “Check cassette tubing” messages.

Please tune handpiece

If the ultrasound surgical function is on and the handpiece is not in tune, this message will be displayed in the status line. If the handpiece is removed and replaced, it must be tuned. If the power detection logic determines that the handpiece is out of tune, then the handpiece should be re-tuned.

Posterior Aspiration

This message indicates that the aspiration surgical function has entered posterior aspiration mode, using the aspiration on/off button.

Posterior Frag

This message indicates that the ultrasound surgical function has entered posterior frag mode, using the ultrasound on/off button.

STATUS LINE MESSAGES

Posterior Linear Rate

This message indicates that the vitrector surgical function has entered posterior linear cut rate mode, using the vitrector on/off button.

Posterior Vitrectomy

This message indicates that the vitrector surgical function has entered posterior vitrectomy mode, using the vitrector on/off button.

Power fail detected

If the main power supply detects a problem with the mains input, this message will be displayed in the status line. When this condition is detected, disk activity is inhibited for five seconds.

Pressure pump hours

The run time on the main pressure pump has exceeded the maximum limit. The pneumatics module needs to be serviced. The “Display Pump Hours” command, found in the “Service Pneumatics” menu of the “Service Menu”, can be used to display the current pressure pump hours.

Prime cycle aborted

This message indicates that the aspiration prime cycle was aborted. Any foot pedal activity, or pressing the aspiration valve button, will abort a prime cycle.

Prime level xxx mmHg

While a prime cycle is in progress, the aspiration up and down buttons can be used to change the aspiration level. This message will be displayed when a change is made to the prime aspiration level. The aspiration prime level is “xxx”.

Re-position cassette

If the cassette level detection logic determines that the aspiration cassette is not properly aligned, this message will be displayed in the status line. This generally indicates that the cassette is pushed into the cassette chamber prior to rotating the knob into the lock position. To correct the problem, rotate the knob to the unlocked position then back to the locked position without pressing on the cassette. The “Cassette position bad” and “Use locking knob only” messages will also be displayed.

Replace cassette

If a high fluid level is detected in the small chamber of the aspiration cassette, this message will be displayed in the status line. If you suspect that this condition was detected in error, remove the aspiration cassette, wait for one second, and re-insert the aspiration cassette. If the condition persists, replace the aspiration cassette. The “Cassette problem” message will also be displayed.

STATUS LINE MESSAGES

Reverse flow detected

If the air exchange surgical function is on and the pressure on the air exchange port exceeds the desired pressure level then this message will be displayed in the status line. This generally indicates that the three-way valve is incorrectly positioned to apply the saline solution to the air exchange port rather than to the infusion cannula. When this condition is detected, the air exchange valve is closed in an attempt to reduce fluid flow into the VitMan.

Service pneumatics

If the time on the pneumatics module has exceeded the maximum limit, when the VitMan is powered up this message will be displayed in the status line. The "Display Pump Hours" command, found in the "Service Pneumatics" menu of the "Service Menu", can be used to display the current pressure pump hours.

Service required

This message indicates that a serious problem was detected and repair of the Syntec VitMan is required. This message will be accompanied by other status line messages that will indicate the problem area.

Air exchange problem - If the air exchange valve is open, the pressure difference between the eye pressure sensor and the air exchange pump pressure sensor should be less than 15 mmHg (for low flow rate conditions the pressure difference will be close to zero mmHg). If a pressure difference of 15 mmHg or greater is detected, this message will be displayed.

Air pump problem - At power-up, a test is made of the ability of the air exchange pump to generate pressure. If pressure was not detected, this message will be displayed when the air exchange surgical function is enabled.

Ground fault detected - If a ground fault is detected by the ultrasound hardware, this message will be displayed in the status line. The ground fault indicates that the ultrasound handpiece is not properly grounded. This problem may be corrected by disconnecting and reconnecting the ultrasound handpiece.

Shutdown at 55°C

If the internal device temperature is 53 °C or higher, but less than 55 °C, this message is displayed in the status line. This message is only a warning and no surgical functions are effected. Under normal operating conditions, the internal temperature of the system will not reach this limit. If high temperature is detected, check for airflow restrictions around the system fan and air duct, at the rear of the system.

Stabilizing...

This message indicates that a hardware problem was detected while waiting for the pressure sensors to thermally stabilize. If this message is present, the VitMan will not function. If this message should appear, power cycle the device.

STATUS LINE MESSAGES

Stage 1 selected

When the stage button is pressed and held, if stage one will be entered when the stage button is released the message "Hold to enter stage 1" will be displayed. Releasing the stage button will cause stage one to be entered and this message to be displayed in the status line.

Stage 2 selected

When the stage button is pressed and held, if stage two will be entered when the stage button is released the message "Hold to enter stage 2" will be displayed. Releasing the stage button will cause stage two to be entered and this message to be displayed in the status line.

Stage 3 selected

When the stage button is pressed and held, if stage three will be entered when the stage button is released the message "Hold to enter stage 3" will be displayed. Releasing the stage button will cause stage three to be entered and this message to be displayed in the status line.

Stage 4 selected

When the stage button is pressed and held, if stage four will be entered when the stage button is released the message "Hold to enter stage 4" will be displayed. Releasing the stage button will cause stage four to be entered and this message to be displayed in the status line.

Stage 5 selected

When the stage button is pressed and held, if stage five will be entered when the stage button is released the message "Hold to enter stage 5" will be displayed. Releasing the stage button will cause stage five to be entered and this message to be displayed in the status line.

Stage 6 selected

When the stage button is pressed and held, if stage six will be entered when the stage button is released the message "Hold to enter stage 6" will be displayed. Releasing the stage button will cause stage six to be entered and this message to be displayed in the status line.

Stage 7 selected

When the stage button is pressed and held, if stage seven will be entered when the stage button is released the message "Hold to enter stage 7" will be displayed. Releasing the stage button will cause stage seven to be entered and this message to be displayed in the status line.

Temp sensor problem

If the temperature sensor is undetectable, this message is displayed in the status line. Powering the VitMan off and then on may clear the problem.

STATUS LINE MESSAGES

Threshold is xx mmHg

The aspiration threshold allows the user to specify the vacuum level required in the 50cc chamber, before the aspiration valve is opened. If aspiration is prevented by the current threshold setting, this message is displayed in the status line, where “xx” is the current threshold value. The aspiration threshold may be adjusted using the “Aspiration Threshold” command, found in the “Aspiration Values” menu of the “Current Settings” menu.

Tuning aborted

If the ultrasound handpiece tuning cycle is terminated by turning off the ultrasound surgical function or by foot pedal activity, this message is displayed in the status line.

Tuning handpiece

While the ultrasound handpiece is being tuned, this message will be displayed in the status line.

Tuning not allowed

If aspiration is off or in alarm, tuning of the ultrasound handpiece is not allowed. If an attempt to tune the ultrasound handpiece is made, this message will be displayed in the status line.

Tuning unsuccessful

If the ultrasound handpiece tuning cycle is unsuccessful, this message will be displayed in the status line.

Ultrasound fuse open

The ultrasound fuse on the analog board has opened. This fuse is resettable, powering the VitMan off and then on may clear the problem.

Urgent system problem

If a communications problem is detected between the CPU board and the analog board, this message will be displayed in the status line. This is a serious problem that requires attention before use. Powering the VitMan off and then on may clear the problem.

Use locking knob only

If the cassette level detection logic determines that the aspiration cassette is not properly aligned, this message will be displayed in the status line. This generally indicates that the cassette is pushed into the cassette chamber prior to rotating the knob into the lock position. To correct the problem, rotate the knob to the unlocked position then back to the locked position without pressing on the cassette. The “Cassette position bad” and “Re-position cassette” messages will also be displayed.

STATUS LINE MESSAGES

Vacuum fuse problem

The vacuum pump fuse on the analog board has opened. This fuse is resettable, powering the VitMan off and then on may clear the problem.

Vacuum pump hours

The run time on the vacuum pump has exceeded the maximum limit. The pneumatics module needs to be serviced. The “Display Pump Hours” command, found in the “Service Pneumatics” menu of the “Service Menu”, can be used to display the current vacuum pump hours.

Valve fuse problem

The valve fuse on the analog board has opened. This fuse is resettable, powering the VitMan off and then on may clear the problem.

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